

Anno 1778.

PHILLIPS ACADEMY



OLIVER WENDELL HOLMES

LIBRARY

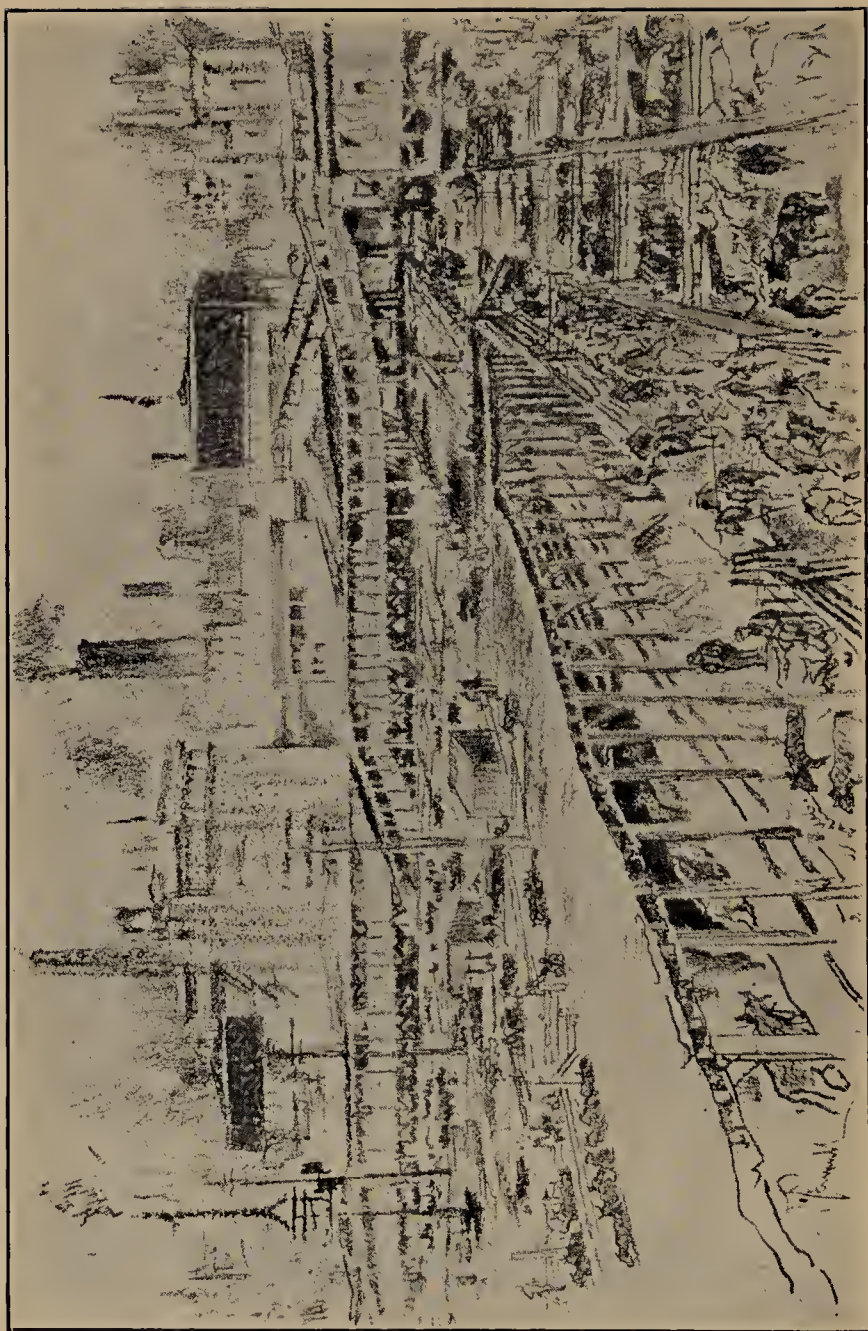
Per ampliora

ad altiora.

p. 12

✓
x'80x





The Heart of a Great Industry—An Impression
From an original sketch by Joseph Pennell

Courtesy Armour and Company

THE AMERICAN LIVESTOCK AND MEAT INDUSTRY

By

RUDOLF ALEXANDER CLEMEN, M. A.

Associate Editor, *The National Provisioner*; Formerly Instructor
in Economics and History, Northwestern University



NEW YORK
THE RONALD PRESS COMPANY

1923

24464

L.

Copyright, 1923, by
THE RONALD PRESS COMPANY

All Rights Reserved

338.1

C59

TO
THOMAS FRANKLIN HOLGATE
DEAN EMERITUS OF NORTHWESTERN UNIVERSITY
SCHOLAR AND UNIVERSITY ADMINISTRATOR
COUNSELLOR AND FRIEND OF YOUTH

PREFACE

In this book is presented for the first time a comprehensive account of the largest industry in the United States and a statement of its fundamental significance in the life of the nation. The production and marketing of livestock alone engages the attention of what is perhaps the most substantial portion of our agricultural population. The packing and curing of meats; the distribution of fresh meats on a national and international scale, by packers, wholesalers, and retailers; the manufacture of by-products of so wide a variety that they enter in some form into the daily use of practically the entire population—these activities with those of actual livestock production employ one in six of the workers of the country. The story of the origin and development of this vast and many-sided group of industries from colonial times to the present is dramatic in the extreme. A clear view of their place in our economic life today and their relation to the public welfare is of the greatest importance.

With so wide a field to cover, the utmost economy of space in treatment has been necessary. The aim in this volume has been to cover broadly and in proper perspective all the main lines of the complex subject, and especially to bring out those important aspects which are less known to the outside public. Accordingly, so far as particular topics have already received adequate treatment in published works the reader has been referred to these for discussion of details. Practically all of the material here presented is published now for the first time.

The gathering and analysis of this material, in the absence of any organized literature on the industry, has extended over a number of years. It has involved much travel; extensive personal investigation; and the examination of a great array

of documents, of the files of many business and agricultural periodicals, and of the data contained in several scholarly studies as yet in manuscript form to which I have most generously been given access by the authors. That the investigation has been carried through at all is owing in very large measure to the advice and cordial co-operation of many organizations and personal friends.

I am especially indebted to the following: the United States Department of Agriculture, particularly the Bureaus of Agricultural Economics and Animal Industry, the Federal Trade Commission, the Institute of American Meat Packers, Paul I. Aldrich, editor *The National Provisioner*, Professor James Westfall Thompson of the University of Chicago, Dr. L. D. H. Weld, Dr. R. J. H. DeLoach, Messrs. John Clay, Edward N. Wentworth, C. L. Harlan, Clytus A. Freeman, and Victor A. Newman.

In the preparation of the bibliography Mrs. Ethel Wight Usher of the John Crerar Library, Chicago, and Mrs. S. K. Maddux aided greatly, and the index is the work of Mr. David M. Matteson, Cambridge, Massachusetts. For assistance in reading the proofs I am indebted to Mr. O. C. E. Matthies. For the opinions expressed throughout the volume, I am, of course, alone responsible.

RUDOLF A. CLEMEN.

University Club of Evanston,
Evanston, Illinois,
April 2, 1923.

CONTENTS

CHAPTER	PAGE
INTRODUCTION	3
Part I—The Pre-refrigeration Period	
I EARLY AMERICAN LIVESTOCK AND MEAT INDUSTRY	21
II LIVESTOCK IN THE MIDDLE WEST—1830-1870	47
III CENTRALIZED CASH LIVESTOCK MARKETS	69
IV THE PACKING INDUSTRY IN THE WEST UP TO 1870	92
V EARLY MEAT PACKING—TECHNIQUE	110
VI EARLY FINANCING OF THE PACKING INDUSTRY	135
VII BUILDERS OF THE MODERN PACKING INDUSTRY	146
Part II—The Refrigeration Period	
VIII THE WESTERN RANGE CATTLE INDUSTRY	173
IX EXTENSION OF LIVESTOCK MARKETS—1865-1885	190
X DEVELOPMENT OF REFRIGERATION	211
XI DEVELOPMENT OF THE DRESSED BEEF TRADE	225
XII PRESENT ASPECTS OF AMERICAN BEEF TRADE	252
XIII GROWTH OF AMERICAN MEAT TRADE ABROAD	259
XIV PRESENT TRENDS OF THE AMERICAN EXPORT MEAT TRADE	299
XV THE UNITED STATES FEDERAL MEAT INSPECTION SERVICE	317
XVI PACKINGHOUSE BY-PRODUCTS AND CHEMICAL CON- TROL	347
XVII NATIONAL DISTRIBUTION SYSTEM FOR PACKINGHOUSE PRODUCTS	379
XVIII COST ACCOUNTING IN THE PACKING INDUSTRY	410
XIX EXTENSION OF LIVESTOCK PRODUCTION—1880-1921.	432
XX WESTWARD EXTENSION OF MEAT PACKING	451
XXI MEAT CANNING AND WAR SERVICE.	462

CHAPTER	PAGE
Part III—Some Livestock Financing and Marketing Problems	
XXII GRADES AND CLASSES OF LIVESTOCK	481
XXIII METHODS OF LIVESTOCK FINANCING	503
XXIV METHODS OF MARKETING LIVESTOCK	534
XXV CYCLES OF LIVESTOCK MARKETING—BEEF CATTLE . .	555
XXVI CYCLES OF LIVESTOCK MARKETING—HOGS	579
XXVII CYCLES OF LIVESTOCK MARKETING—SHEEP AND LAMBS	597
XXVIII PROBLEMS OF ORDERLY LIVESTOCK MARKETING . . .	607
XXIX RECENT EXPERIMENTS IN LIVESTOCK MARKETING METHODS	637
XXX THE CO-OPERATIVE LIVESTOCK MARKETING MOVEMENT	660
Part IV—The Packing Industry in Its Public Relations	
XXXI LABOR IN THE PACKING INDUSTRY TO 1904	681
XXXII HUMANIZING THE PACKING INDUSTRY—1904-1922 . .	704
XXXIII MONOPOLY IN THE PACKING INDUSTRY	745
XXXIV THE FEDERAL TRADE COMMISSION INVESTIGATION . .	768
XXXV THE PACKING INDUSTRY AND GOVERNMENT REGULATION	782
XXXVI TRENDS IN THE AMERICAN MEAT INDUSTRY	792
APPENDIX BIBLIOGRAPHY	811

LIST OF ILLUSTRATIONS

The Heart of a Great Industry—An Impression *Frontispiece*

FIGURE	PAGE
1. Maps Showing the Geography of Meat Production and Consumption	7
2. (a) Map Showing Change in Center of Hog Production, 1840-1920	50
(b) Map Showing Change in Center of Cattle Production, 1840-1920	66
3. Jacob Dold (opposite)	148
4. Philip Danforth Armour "	150
5. J. Ogden Armour "	154
6. Nelson Morris "	156
7. Gustavus Franklin Swift "	160
8. Louis F. Swift "	162
9. Michael Cudahy "	164
10. Thomas E. Wilson "	166
11. Watering Cattle on a Western Range "	182
12. Interior View of a Loaded Modern Refrigerator Car	223
13. Dressed Beef in Cooler (opposite)	236
14. Cattle Markets	258
15. Beef Steer Showing Cuts (opposite)	260
16. Percentage of Beef Production Exported from 1907 to 1921	291
17. Chart of Yearly Exports of Meat and Meat Products	302
18. United States Inspected and Passed Beef (opposite)	336
19. Map Showing Location of Government-Inspected Slaughtering Plants	345
20. Chart Showing Percentage of Beef and By-Products from a 1,080- Pound Steer	349
21. Chart Showing Weights and Prices of Retail Cuts from a Side of Beef	350
22. Chart Showing Percentage of Pork Products from a 250-Pound Hog	351
23. Pharmaceutical By-Products	370
24. (a) Chart Showing Departmentization of Cattle Business	424
(b) Chart Showing Departmentization of Hog Business	425
25. (a) Map Showing Number of Cattle on Farms, 1850	433
(b) Map Showing Number of Cattle on Farms, 1920	430
26. Map Showing Change in the Center of Sheep Production, 1840-1920	445
27. Grades and Classes of Cattle (opposite)	482, 484
28. Grades and Classes of Calves "	488
29. Grades and Classes of Hogs "	494
30. Grades and Classes of Sheep "	500
31. View of Chicago Union Stock Yards "	540
32. Buying Cattle in the Yards	546
33. Entrance to Chicago Union Stock Yards	550
34. (a) Chart Showing Percentage of Cattle Received Each Day of Week at Chicago	641
(b) Chart Showing Percentage of Hogs Received Each Day of Week at Chicago	641
(c) Chart Showing Percentage of Sheep Received Each Day of Week at Chicago	642
35. Organization Chart of Industrial Relations Department, Swift and Company	714
36. Chart Showing Comparisons of Wages in the Packing Industry with Cost of Living in the United States	722

THE AMERICAN
LIVESTOCK AND MEAT
INDUSTRY



INTRODUCTION

Meat Industry Beginnings

Meat packing in the United States began in colonial times with the farmer-packers who "packed," that is, cured and smoked, meat for local use during the winter time. About the year 1640 the civil war in England, which kept English traders at home and restricted their markets, enabled the colonists to take over the supplying of the West Indies with livestock, barreled beef and pork, bacon, and hams. The first American packer giving his whole time to the business was William Pynchon of Springfield, Massachusetts. The name "packer" has been used since that time, although "packing" comprises today a relatively small part of the meat industry. Before 1870, meat was dried and smoked and shipped in barrels or in bulk, and later was pickled for the "plantation trade" and seagoing vessels when dried or smoked meats would not do for these consumers. Today most of the livestock slaughtered is shipped as dressed meat in refrigerator cars.

After the War of Independence there came a new era in our agricultural history, one of the most important features of which was the agrarian migration and the shifting of the center of livestock raising to the Ohio Valley. This made possible, indeed made necessary, the rise of an organized industry of meat packing with its headquarters at Cincinnati, for meat packing follows livestock.

In 1794 two events greatly stimulated settlement in Ohio and also encouraged cattle and hog raising. The first was the elimination of the Indian menace after the Battle of Fallen Timbers. The second was the Whiskey Rebellion, the establishment of an internal revenue system and the placing of an

excise on whiskey. When the farmer lost the right to convert corn into whiskey he turned his attention to the raising of cattle and hogs.

Cincinnati the Meat Center

The first regular packer in the West was Elisha Mills, a "downeaster" who began in Cincinnati in 1818. Small packinghouses grew up in many of the river towns in this middle west region, but from 1830 to 1865 Cincinnati was the most important center for the business, and in 1840 had been labeled "Porkopolis." Cincinnati was already known as the "Queen City of the West." It had a strategical position on the Ohio River, the center of a great fertile territory. It was a steamboat building center and a natural port on the main lines of communication which were then north and south. The remarkable growth of Cincinnati, however, came with the development of a second advantage in the form of superior transportation facilities radiating from it which made possible the concentration and marketing in that one city of the livestock of the region.

From that time until the Civil War, Cincinnati had a monopoly control both east and west. It had a choice of markets. Further, Cincinnati had superior banking facilities and the packing industry even then demanded large sums to be paid in ready cash.

Between 1830 and 1860 it was first recognized—as Professor James Westfall Thompson has pointed out—that there is a definite belt or zone of territory lying between the 36th and 43rd parallels and extending west to the 100th meridian, which may be called the "American Beef Belt." It was found that the cattle pastured there fattened in less time and mixed their lean and fat more fully and evenly than cattle fattened elsewhere. North of this zone the intense cold caused unprofitable consumption of provender necessary to preserve the required amount of animal heat and the beef was of poor quality,

dark in color and with inadequate mixture of fat and lean. South of this zone beef became stringy and fat because tallow was not interlarded with the flesh.

Central Cash Livestock Markets

Out of the above situation there developed the great centralized cash livestock markets of the Middle West which have been a fundamental factor in locating the meat packing industry on a large scale in that region.

For a long time great droves of surplus livestock had been driven on foot from the Beef Belt over the mountains to eastern markets by professional drovers. These cattle markets and the cattle fairs of the Middle West, like those in Bourbon County, Kentucky, and Madison County, Ohio, were picturesque. After a time the fairs declined in importance, partly because of want of energy and system, and partly because the growth of population in certain centers and the development of transportation necessitated large-scale markets. As cities like Cincinnati and Chicago became great collecting points for the business of droving, we find the packing industry developing there.

The tendency toward concentration of livestock for the supplying of the eastern markets was greatly accelerated by the railroad building of the fifties. This railroad construction meant connecting East and West as cheaply and readily as West and South. The most important of the new trunk lines were the New York Central, Pennsylvania, and Baltimore and Chesapeake Bay.

Although large numbers of livestock were collected at Cincinnati, St. Louis, and Chicago, there was for years no necessity felt for the combination of conveniences known as "stockyards." But as time went on drovers wished for a place to keep their stock awaiting sale. In Chicago several yards were laid out, the earliest being the Bull's Head Market in 1848. During the Civil War, when an enormous increase

in production of hogs and cattle took place, the existing yards were found to be too small; dealers, shippers, packers, and railroads were greatly inconvenienced. Buyers and sellers had to be brought together. So on Christmas Day, 1865, the Chicago Union Stock Yards were opened.

Livestock Commission Men

A few years previously the most important factor in cash livestock markets had emerged. This was the livestock commission firm, the earliest of which began business in Chicago in 1857. The practical advantages connected with the commission firms were at once apparent. The commission man was always in the market and knew what stock was worth. To increase his commissions it was to his interest to get the highest prices possible. It was desirable that he be a man of integrity. Previously the sale of livestock had been on a credit basis, often resulting in loss. Now the drover could ship his cattle to a market and draw on the commission man for the money as soon as the livestock was delivered. Evidence of the advantages of this factor appears in the fact that as soon as the system began to work a great many men went into the business of shipping livestock east to markets to meet the demand. Thus by the end of the Civil War the essential factors of the modern American centralized cash market were present—stockyards, livestock commission firms, and meat packing companies.

Causes of Modern Meat Industry

It is one of the most remarkable coincidences in economic history that in the years 1870–1875 there should come to the front in response to an economic necessity, the four factors whose combination was essential for the development of the meat industry of today. These factors were, first, the opening and developing of a new source of supply of livestock; second, the extension of railroad transportation to the source

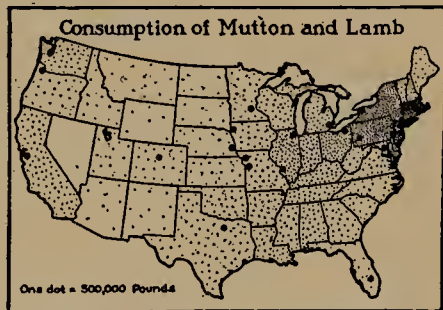
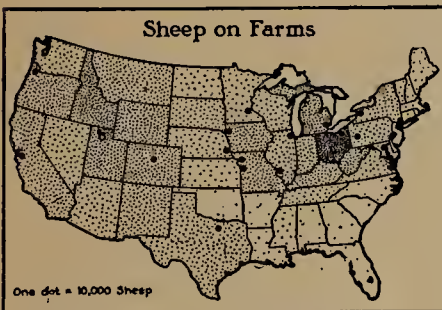
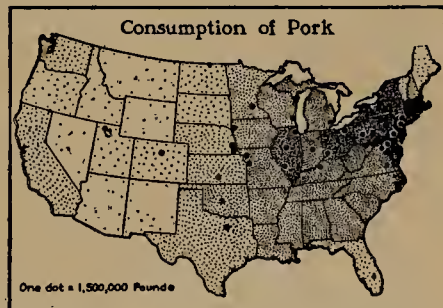
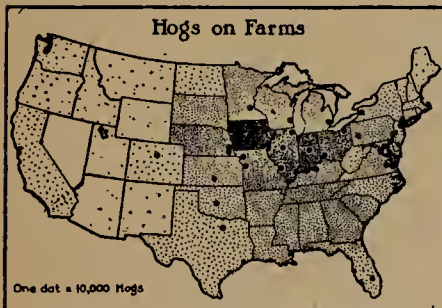
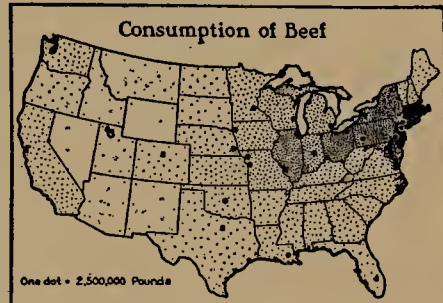
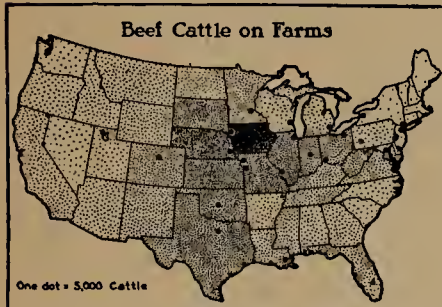
of supply; third, refrigeration; fourth, men to organize the distribution of livestock and meat in the most efficient way.

In 1865 a government report by Dr. Loomis presented the first careful study of the distribution of livestock in the

THE MEAT SUPPLY

Where It Comes From

Where It Goes



Number on Farms January, 1, 1920.
Data from - Bureau of Census.

Based on per capita consumption as estimated
by the Bureau of Crop Estimates for 1919, and
the 1920 Population.

Large dots show the location of Principal Slaughtering Centers.

Courtesy Commercial Research Department, Swift and Company.

Figure 1. Maps Showing the Geography of Meat Production and Consumption

United States. It showed the dependence of East upon West for meat. It also showed the necessity of increasing the beef production. By that time, however, Texas, which had developed a cattle industry, was becoming overstocked and after the Civil War began to send its surplus north. From that situation came the beginning of cattle driving on the great trails to shipping points from which the livestock could be sent east. Very shortly after came the establishing of the great cattle ranges of the Far West over which has been thrown the glamor of song and story. By 1885 the heyday of the ranges was past and they gave way to the ranch farm.

As the ranges increased there was a constant urge westward on the part of the railroads which soon slashed in every direction the states between the ranges and the American Beef Belt. Though at first skeptical of the cattle trade, the roads soon encouraged it markedly by a system of rebates and freight wars over the transportation of livestock east.

Meat Trade Revolutionized by Refrigeration

Such was the situation when inventions in refrigeration made it possible to pack meats all the year round and to do away with the long haul of livestock. Refrigeration made it possible to utilize to the fullest extent the supply of livestock and it made the distribution system of meats nation-wide and world-wide. It prevented the decay of perishable products. As it lengthened the period of consumption it led to greatly increased production. It enabled the owner to market his product at will. Finally, it made possible the transportation of fresh dressed meat in good condition from points of production to points of consumption. These aims were realized in the early seventies and were of fundamental importance.

The great problem which then faced the meat industry was how to apply refrigeration to transportation. Attempts to build refrigerator cars had already been made in the late sixties and early seventies. Some shipments, indeed, had

been sent to Boston with fair success. But up to 1875 no great progress had been made.

The Packers

At this point the new packers appear. Up to 1875 packers had been pork packers. From that time on in the development of the beef trade the packers with a national market were those who knew cattle dealing and either had been cattle dealers, or had acquired the knowledge subsequent to developing a pork packing business. Of these new packers the names that come to the public mind most readily, though they are not by any means the only ones, are Hammond, Morris, Armour, Swift, and Kingan, who have been called the builders of the modern meat packing industry and whose biographies are stirring romances of American business. It was the work of these men with the refrigerator car which revolutionized the meat industry, created the dressed beef traffic on a commercial basis, and organized the distribution system of the modern meat industry. In this task they showed courage seldom equaled in commercial history.

The Dressed Beef Trade

The experience of one of these men shows with what extraordinary rapidity the new dressed beef trade grew, for G. F. Swift, a Yankee from Cape Cod, typifies this development. Swift, like his contemporaries in introducing dressed beef into national commerce, was a careful student of business problems. He had had good training in cattle trading and had seen the necessity for reform in the slaughtering and butcher business. The methods of slaughtering followed everywhere by the local butchers, who then dominated the situation, were a menace to public health. While Swift was a cattle dealer in Brighton, Massachusetts, in 1870-1873 he had seen the State Board of Health force concentration of slaughtering under regulation with success.

In 1875 G. F. Swift went to Chicago, the same year, as it chanced, that his great rival, P. D. Armour, moved to Chicago from Milwaukee. Swift soon saw, as did Hammond, Armour, and a few others, the possibilities of concentrating slaughtering in a few large centers and shipping dressed beef in refrigerator cars. In attacking this problem Swift was instrumental in discovering some of the fundamental principles of refrigeration for railroad freight cars.

Winning of National Market

Swift was in a logical position to introduce dressed beef into the markets of the East. He was well known in New England, whence he had come, and he had brothers on the spot to aid him. Again, his method was a shrewd one, for he allied himself in partnership with the leading slaughterers in the various towns, persons of importance who had a clientele, a successful meat trade, and capital. These partnerships lasted well into the nineties.

The fight to get dressed beef into the markets of the country continued for over a decade and was extremely bitter. First, the consuming public was prejudiced against it. Second, the railroads did not like the new business. And third, the local butchers throughout the country fought it in all possible ways—by boycott, press propaganda, and legislation.

By the time the dressed beef trade had become a permanent business the meat packing industry had established, in the main outline at least, its remarkable distribution system of branch houses and car routes, a system which merits careful study. Moreover, the development of the system in the United States soon led to the development of an export meat trade which has attained great proportions.

Federal Meat Inspection

The dressed beef traffic brought in its train two factors of great and lasting benefit. The first in importance was the

inauguration of the Federal Meat Inspection Service, putting the slaughtering of livestock and preparation of meat for interstate commerce under the best inspection system in the world. The principal packers themselves urged such federal inspection previous to 1890, when the first act was passed, and again in 1906. The efficiency and honesty of the system have been attacked in years past, but its high standard is unquestioned today.

The other economic benefit that grew out of the dressed beef trade has been the introduction of chemical control in the packing industry. Today the amount realized for the dressed beef is normally much less than the purchase price of the live animal. Chemistry has made that possible through the development of a great number of by-products. There are now, because of large-scale plants, the analytical chemist, the research chemist, the chemical engineer, and the business or commercial chemist. Chemical control has also made it possible to set and maintain definite standards of quality.

Such is the American system of large-scale meat packing, whose development has resulted logically from economic necessity. The meat industry, whose rise has been sketched in outline here and which will be treated in detail in this book, has been recently the subject of widespread interest and discussion, both in Congress and outside. This public interest and controversy resulted after several years in the dramatic dénouement of government regulation through the enactment of the Packers' and Stockyards Act of 1921.

Modern Problems in Meat Packing

The meat industry at the present time presents four problems which are considered in this work. One is internal and the other three are of an external or public nature. One is concerned with the actual physical operation of the ordinary packing business unit at a profit. That is a business proposition. The other three problems have a wider social signifi-

cance and deal with the relations of the packing industry to other industries, to the government, and to the public.

The actual technical manufacturing processes of the meat packing industry are so highly complicated and so manifold in number that they cannot properly be taken up in a work dealing with the general economic development of the industry. They may be found in a recent authoritative book on the subject, entitled "The Packers' Encyclopedia." On the other hand, the methods of analyzing the various costs entering into the actual operations of a packing plant are of economic importance and fundamental in understanding the meat business. This subject therefore is treated in the present work under the title of "cost accounting."

The external problems of the packing industry—the problem of marketing livestock, the problem of labor, and the question of monopoly—are treated in this book in the order just given.

Livestock Grades and Classes

The grades and classes of livestock, cattle, hogs, and sheep are many and various, as can be seen from the quotations of prices at public stockyards day by day. Some of these grades are more desired by packers as raw material than others. It has been difficult to get a standard uniform classification because buyers themselves often disagree, for a good deal depends upon the receipts and on individual opinion. Recently, however, attempts have been made both by packers and by the United States Bureau of Agricultural Economics to develop a classification that shall be considered standard, an effort which represents definitely a step forward. Both of these tentative classifications are given in this work.

Closely bound up with the actual production of livestock and the types, grades, and classes, is the method of financing the production of livestock. This has had an interesting development. Indirectly it is of great importance to the pack-

ing industry. There has been gradually evolved in this country a highly articulated system of agricultural finance or agricultural credit. For livestock there are cattle loan companies and other private agencies, some of which aid livestock production in a very real but indirect way. Since 1900 much progress has been made, and as a result of war conditions there has been worked out by government agencies, such as the War Finance Corporation, joint-stock land banks, and other institutions, a national agricultural credit system regarding which there is as yet little systematized information.

Methods of Marketing

After livestock have been produced and brought to maturity through adequate financing they have to be marketed. The present methods of marketing are an evolution from the cruder methods of earlier times. They throw a profoundly interesting light upon the economic life of the nation, for the stockyards today are a throat or channel through which the meat supply of the nation has to pass on its way to the consumer. In general the functions of central livestock markets include:

1. Providing great cash markets where livestock can be bought and sold.
2. Providing facilities for the handling, care, feeding, weighing, buying, and selling of livestock and the financing of sales.
3. Enforcing rules of purchase and sale through highly organized livestock exchanges.
4. Providing facilities for the collection of information as to the supply, demand, and other considerations influencing the trade.
5. Aiding in the quotation of prices of livestock.
6. Serving as central points from which livestock may be conveniently shipped to stockmen, feeders, eastern buyers, and foreign markets.
7. Acting as final markets for some 70 per cent of the entire receipts.

8. Concentrating large numbers of animals at a few places and facilitating the federal and state inspection of livestock and meats.

Defects in Present System

As a basis for intelligent modification of the marketing system, to remedy these defects, a study of seasonal movements or cycles, analyzing the livestock supply which is marketed and the whole structure of price is most important. A knowledge of these cycles is the basis on which the plans for modifying the present marketing system must be built. And it is clear that it would be desirable to modify it in some ways, for the defects are of a nature which indicates of itself the desirability of a remedy.

These defects in the present livestock marketing system can be summarized as follows:

1. Marketing takes place in almost complete ignorance of the supplies to be marketed.
2. No permanent organized attempt has been made to accommodate supplies of livestock to consumptive demand for meats.
3. There is no permanent method by which temporarily excessive receipts can be checked by concentrated efforts of shippers.
4. Faulty distribution within each week makes efficient handling very difficult.

Attempted Solutions of Marketing Problems

Wartime emergency brought temporary attempts to solve the problem of marketing livestock by more orderly methods. The first of these was known as the "zoning" system, in relation to central markets. From some zones livestock could be shipped on certain days of the week and from other zones on remaining days. This device was intended to stabilize market receipts and prices by establishing a five-day market instead of the present two-day market. A second device was the "hog

price control" plan which was put into effect by means of an agreement between producers, packers, and the United States Food Administration.

The success of these plans, temporary as it proved to be, was due in part to the great purchasing power of the Food Administration, but in greater measure to the new element of co-operation between the different interests concerned, which had been developing for several years and which resulted in various conferences on a nation-wide scale. This co-operative livestock marketing movement seems likely to bring a permanent organization of agricultural interests for the bettering of marketing methods. Its ideas are put into effect by a central body known as the National Livestock Producers' Association, which directs the work in a general way. The actual co-operative marketing is handled by co-operative livestock shipping associations and commission associations of livestock producers. The future seems to lie with some form of co-operation, but probably success will rest with a form of co-operation that includes all factors in the industry. And of these factors meat packers form one.

Labor in the Meat Industry

The second problem of great social importance in the present packing industry is that of labor. The phenomenal division of labor in modern American industry is shown at its maximum in meat packing. The development of this feature, the different races that have come into the industry at centers like Chicago, the rise of trade unions among them, and the great strikes culminating with that of 1904, make an interesting story. But of more constructive significance is the period since 1904, when the packers began to humanize the industry, to better the conditions and hours of work. Welfare departments, gymnasiums, medical and dental service, cafeterias, libraries, pensions, benefit associations, and a system of employee representation in plant assemblies whereby the work-

ers and management work out the conditions of labor—all these have been established in order to make the lot of the worker easier and to stimulate greater co-operation between management and labor in the success of the whole institution.

The Question of Monopoly

The question of monopoly in the packing industry is one which has attracted a great deal of public attention. Stretching over a period of thirty years there have been three major federal investigations. There have been also judicial cases, the conclusive one of which in 1912 resulted in a verdict of "not guilty."

The monopoly charge itself has been based in great measure on the fact that the percentage of livestock receipts purchased by each of the larger packers remains approximately constant from year to year. This is explained by the fact that each company is continually endeavoring to increase its percentage, but is met by the competition of the other packers. Constant competition means that it is difficult for any single packer to increase his percentage to an appreciable extent.

The final investigation was carried on by the Federal Trade Commission which began its work in 1917. The investigation resulted in a report in which the five larger packers were charged with the maintenance of a monopoly based upon secret agreements for division of livestock purchases and collusion in the sale of meat and meat production. At the time the report was written there was a great wave of sentiment in favor of government ownership, and government ownership was in fact recommended by the Commission. But this policy was not adopted by Congress.

While the charges made by the Trade Commission were refuted, the larger packers realized that public opinion was so stirred that some concession ought to be made to it, especially since the effect of the report at home and abroad upon the meat

business had been distinctly bad. This determination had its outcome in the so-called "consent decree," which was a voluntary agreement on the part of the larger packers to dispose of their interests in public stockyards, stockyard terminals and railroads, market papers, cold storage warehouses, and to give up the sale of "unrelated lines" and the use of their distribution system for other than meat products.

Government Regulation of Meat Packing

In the meantime a succession of bills for regulating the packing industry was introduced into Congress and finally the Packers' and Stockyards Act of 1921 was passed. By this act the regulation of the industry is entrusted to the Secretary of Agriculture, who delegates it to an assistant in charge of the Packers' and Stockyards Administration, and provision is made for investigation and for penalty in case of violation of orders of the Secretary—and also for appeal. While the act seemed to make friction almost unavoidable, the first year's record was one of constructive co-operation and—what is more—of progress.

Co-operation and the Future

At the present time the industry enjoys a unique position as the largest in value of product in the United States. The chief feature to be noted as a result of its rapid expansion over the whole country is the development of co-operation; first, among packers; second, with producers; and third, with meat retailers. The entire meat industry in this way has been unified for more effective work. The increase in efficiency has been facilitated by the establishment three years ago of the Institute of American Meat Packers with headquarters at Chicago, an outgrowth of the earlier American Meat Packers' Association organized in 1906. Its influence on the future development of the meat industry will be great, for it will under a recently adopted plan become a combination of trade associa-

tion, industrial museum, research institute, and educational institution. It represents the organization of the meat industry on a scale and with a vision which shows an amazing development in the space of a single generation.

PART I
THE PRE-REFRIGERATION PERIOD

CHAPTER I

EARLY AMERICAN LIVESTOCK AND MEAT INDUSTRY

Development of Livestock Industry

The meat packing industry from its very nature must always be most closely associated with the livestock industry, since it relies on the latter for its raw material. Throughout its entire history its organization and location have depended upon the distribution and spread of the livestock of the country. With the development and westward trend of American livestock following the frontier settlements we have a similar movement of the American meat packing industry. It is necessary to review the progress of livestock for an understanding of meat packing.

New England

The colonists who settled in Massachusetts took care to be supplied with cattle, though it was no easy thing for the people in England to send such cattle on the small ships of the period. These first cattle were imported in 1624 by Governor Edward Winslow and came from Devon and adjoining counties. Each year more cattle were brought, mostly for the "Governor and Company of Massachusetts Bay in New England," and by 1632 the cattle stringency of the New England counties was somewhat relieved. This was in spite of the losses caused by the Indians and wolves which sent the price of cows in 1636 from £25 to £30 each.¹ It was in order to find pasturage for

¹ Executive Document, 1854, Vol. 7, p. 2.

their cattle that the settlers scattered widely and founded so many new towns, as, for example, Concord.²

The breed of the cattle was improved by the action of Captain John Mason in introducing into New Hampshire some large yellow cattle from Denmark. In 1638, 100 of these new oxen were driven to Boston and sold for £25 a head.

It was the idea of bettering their condition and that of their livestock that led William Pynchon and others to remove from Roxbury and establish a new settlement on the Connecticut, but within Massachusetts, at a place later called Springfield.³ The same year, 1636, 260 cattle were driven from Newton, Massachusetts, to Hartford, Connecticut, by emigrants who founded that town. A little later New Haven and Windsor and other places were settled. And after fifteen years of labor the colonists in New England were fairly well provided with cattle and hogs, though few references to hogs are to be found in the records.⁴

It was, however, quite different with sheep. Their failure to increase rapidly and the ravages from wolves, the climate, together with lack of care on the part of the colonists, made it difficult to keep them from utter extinction.

First American Meat Trade

It has been pointed out that just as New England had entered upon prosperity, it was profoundly disturbed by the outbreak of the Puritan Revolt in England against Charles I and the Civil War which followed. These events kept Englishmen from coming to America and the English markets for goods fell away. Hard times reached their lowest ebb in 1641 with a drop in cattle values similar in its effect to a modern panic.

² Thompson, J. W., *A History of Stock Raising in America from Earliest Colonial Times to the Present (1607-1916)*. (Unpublished.) Chap. II, p. 7.

³ Barber, *History Coll.*, p. 291.

⁴ "There are not many Towns in the country," records Johnson in "Wonder-Working Providence," Bk. I, Chap. XXI, "but the poorest person in them hath a house and land of his own and bread of his own growing, if not some cattell: besides flesh is now no rare food, beef, pork and mutton being frequent in many houses."

The significance of this event is that the hard times stimulated enterprise. England and Ireland no longer supplied the British West Indies with cattle and sheep as formerly, while the planters themselves gave all their attention to staple tropical products. All livestock, wool, and barreled beef, pork, bacon, and hams required for the planters and their slaves had been imported. With the failure of England and Ireland to continue supplying the islands, the farmers of New England set out to capture this trade.

And in this commerce Massachusetts and Rhode Island grew rich. Winthrop wrote: "Now the country doth send great store of biscott, flour, peas, beef, porke, butter and other provisions to the supply of Barbadoes, Newfoundland and other places." Virginia and Maryland also supplied a market for these products. Writers stated that the other American plantations could not well subsist without New England. In this way there was given the first impetus to the development of a meat industry in the colonies.

First American Packer

The natural richness of the Connecticut River Valley drew settlers into western Massachusetts where Springfield, Hadley, and Hatfield were founded. In the second half of the seventeenth century this region became famous for stock raising. And here lived the first American packer in William Pynchon of Springfield. In the autumn preceding 1655 he began as a drover, taking cattle from Springfield to Boston, and by 1670 he was sending winter-fattened cattle. Indeed, stall feeding may be said to have originated with the farmers of Springfield and Hadley.

Pynchon, however, did more than fatten live cattle for the Boston market. He also dealt in mutton tallow and wool,⁵ but his chief business was pork packing. Between 1662 and 1683 he bought and packed great numbers of hogs, presumably

⁵ Judd, Hadley, p. 372. He bought sheep in Rhode Island in 1655.

in the main for the West Indian trade. Pynchon's records give some information as to the swine in colonial New England. Most of them were black or sandy in color and of no choice breed. They were "razor-backs," wild speedy runners ranging the woods in a wild state. They were also able to fight off the wolves. According to Pynchon it does not seem to have been the custom to fatten at all before killing, which was probably due to the prevailing scarcity of corn.

Prices Paid

It was usual for Pynchon to pay the farmers for their hogs $2\frac{1}{2}d.$ to $3d.$ per pound in "country pay." The weight of several typical lots of hogs are given in his records. One lot of 162 hogs weighed 27,409 pounds, averaging 170 pounds per animal. Sixteen weighed less than 120 pounds; 25 weighed over 200 pounds, and two ran up to 270 and 282 pounds respectively.

Cured pork at that time was higher in price than cured beef and was generally a better article. In 1685 the Saco minister got beef at $1\frac{1}{2}d.$ and pork at $2\frac{1}{2}d.$ per pound. Pork and beef were often named in the Connecticut and Rhode Island rates as receivable for taxes. At that time pork sold from 50s. to 70s. per barrel, the latter being in those days a high figure.⁶

A difficulty the colonists were confronted with was the habit the Indians developed of stealing and killing cattle and hogs. Sometimes they would even bring the pork to town for sale. Concord tried to solve the problem by enacting a law that "all swine owned by Englishmen should be marked on their ears, but that the Indians should not mark their swine, and when the latter came to peddle pork they were to bring the ears of the slaughtered hog along as proof of ownership, or else the meat was forfeited."

⁶A barrel of pork in 1671 exchanged for 300 pounds of sugar in Barbadoes. (Weeden, Vol. I, p. 333.)

Farmer-Packers

With the danger of the Indians gone after King Philip's War (1675-1676), new localities were settled and among them the Merrimac Valley, which soon became as important a cattle raising country as the Connecticut. In both places, especially around Hadley, as new grazing towns were settled, a brisk business was done in barreling beef and pork. William Pynchon's career as a packer had ended in 1683, but after him came numerous successors in the business. Towards the end of the century Worcester, Massachusetts, had excellent meat cattle and a good beef and pork trade.⁷ At the same time it must be noted that most of the cured meats were prepared by the individual farmers who killed their own stock for local use. An example of these farmer-packers who were also cattle traders was a Mr. Lewis of Farmington, Connecticut. Later during the Revolution he was chiefly concerned with slaughtering and salting cattle to be sent to Fishkill from the state of Connecticut.⁸

It was a custom for the farmers to have what they called "the killing time," slaughtering at that season a bullock or two, with several hogs and perhaps a few sheep, which had been fattened expressly for the family's provisions during the ensuing year. This generally took place late in the fall or sometimes as late as Christmas. The barn floor was used, with tackle fastened to the stout beams and the animals were hoisted and dressed. A rough framework was erected and the hogs as a rule were dressed near their pens where hot water was easily procured.

In towns like Salem there sprang up naturally a demand for beef. Several large slaughter houses were erected to care for this business, but in spite of this improved system trouble arose and complaints were made. For example, it was urged that the citizens of Boston were obtaining their meat direct

⁷ Dwight, *Travels*, Vol. I, pp. 374-376.

⁸ Chastellaux, *Travels*, p. 32.

from the outlying country districts instead of through the local Boston butchers and slaughter houses. As a remedy for this the butchers of the town formed a guild to supply meat at a price named by the selectmen.

Cattle and Hogs

As years went by the New England colonies could not compete with Virginia and the Carolinas in supplying the West Indies with live beef cattle and pork products. Much of the barreled meats not destined for strictly local use were consumed by the fishing fleets. But cattle continued to be generally raised in New England, chiefly for local needs. Most of the cattle trade centered in Boston. From 1753 to 1757 William Clark of Northampton regularly drove cattle to Boston and Cambridge. His account book shows the small size of cattle at that time, the average of twelve oxen being only 767 pounds. As to prices they ranged from 16s. to 20s. per hundredweight. An exception to the usual run was a steer five years old whose weight was 2,270 pounds, which with another furnished a dinner for General Washington and all the officers of the army at Valley Forge.

There was a marked difference between the condition affecting the hog and cattle markets. The author of "American Husbandry" (1775) states that "hogs are throughout the province in great plenty and very large, a considerable export from the province constantly goes on in barreled pork."⁹

Boston Meat Market

While the early markets for livestock and meats in colonial New England followed the custom of Old England, the open market law was never introduced. Nevertheless, the holding

⁹ American Husbandry, pp. 80-81.

The center of pork-packing and barreled beef extended beyond the Springfield region though on a smaller scale. Timothy Dwight of Northampton once packed 50 hogs which averaged 201 pounds; Deacon Hunt of the same place killed a hog in 1774 that weighed 335 pounds—the first New England hog of record to weigh over 300 pounds. (Judd, p. 371.)

of a market or a fair was in some instances made a condition of a charter or privilege, as, for example, at Newcastle, New Hampshire, in 1693.

Boston became the greatest center, but was tardy in setting aside a place for a market. In 1633 the spot where the old State House stands was made the market place by an order of the Court of Assistants. Other towns like Dorchester, Charlestown, Salem, and Lynn soon applied for privileges of a market town. By 1696 market was held on Tuesday, Thursday, and Saturday of each week, the ringing of a bell announcing the opening and closing hour. The country people, however, complained that this custom of special days worked to the advantage of the townspeople, since it caused a glut of provisions, with the result that in 1734 the market was open every day. In this market there were no middlemen. The farmers came and sold their own produce for West Indian articles and they also did some itinerant marketing.

It was not until 1742 that the old-fashioned ways came to an end with the erection of Faneuil Hall where buyers and sellers might meet. Regulations were then voted regarding the quality of meats sold and as a result both the producer and the consumer were greatly aided.¹⁰

Such was the meat market of colonial Boston.¹¹ To supply this market there grew up, during the occupation at Cambridge by the provincial army under Washington then besieging Boston, the slaughtering industry at Brighton, the importance of which in the development of the meat packing industry in after years will be noted later.

The Middle Colonies

The Dutch West India Company brought over the first livestock to New Netherland. Each tenant was given cows, sheep,

¹⁰ One regulation ran thus: "No unwholesome, stail or blown meat or leparous swine shall be sold or exposed to sale in the market under penalty of 10s."

¹¹ The crude ideas of a market of that time may be seen from a vote of 1745—"all small meat, before brought in, must have the feet cut off and quartered and cleaned from brains."

and pigs for six years. In the beginning the pioneers lived in sod cabins, later on in log houses, and their staple product was hogs, which wandered in the woods and fed on acorn and nuts and in the winter at least furnished a hard, clean pork. Soon, as a result of a liberal policy, settlers increased in numbers and little villages grew up along the shores and rivers. The cattle were mostly of the Holland breed and larger than the English cattle. Grazing for slaughtering increased. Hogs multiplied with great rapidity. English breeds were more hardy, but Holland hogs grew larger and heavier and had thicker pork. Sheep were not as numerous as in New England.

During the Dutch period the slaughter houses and cattle pens in New Amsterdam were almost as important elements of the landscape as the windmills in Holland itself. They straddled the ditch on the north side of the palisade that later gave its name to Wall Street, the effluvia flowing down this streamlet through the Water Poort, or Water Gate, into the East River. Hog pens, outhouses, and other nuisances encroached upon the crooked streets.

The material prosperity which the English brought to New York was apparent in the increase in trade, especially trade in provisions and meats. Governor Andros in 1678 mentions "beefe" and pork as articles of export from New York.¹² Indeed, like the New England colonies, New York carried on a brisk business with the West Indies in salt beef, hams, bacon, and livestock. Though not as important as Boston or Philadelphia, New York was becoming a cattle market and the center of a region supplying cheap livestock and meats.

Slaughtering in New York

Early in the history of the colony we find the butchers of New York City subject to definite rules regarding slaughtering. In 1656 an order was put into effect as follows:

¹² Quoted by DeVoe, *The Market Book*, Vol. I, p. 87.

From this time forth, neither in this city, nor in the plains belonging to this province, shall any cattle, hogs, goats or sheep be permitted to be slaughtered, not even by the owner himself, unless the owner first, on the same day he intends to slaughter, shall have given in such creature as his own, to the magistrate of the respective place to which he belongs and from him obtain a slaughter certificate.

For this a fee was exacted according to the size or value of the animal which was paid to a public officer, called the "slaughter farmer."¹³

At the same time sworn butchers were ordered and confirmed "who shall each be bound to serve in butchering and cutting up, and to provide, have and possess their own ropes, hand barrows, troughs and other articles requisite for slaughtering and receive certain fees" which were stated. The oath taken was a solemn one.¹⁴

Previous to 1676 cattle were slaughtered in the city below Wall Street and on the Brooklyn shore, but it became so objectionable that the killings were ordered outside the city wall. This, however, gave the "slaughter farmers" so much trouble in the examination of each animal, and there were so many wrangles as to their value, that the authorities had a public slaughter house built on a spot now on the east side of Pearl Street between Wall and Pine. It was set forth by the "slaughter farmers" that "all persons should have liberty to kill and hang therein meat, these paying for the same as formerly," i.e., so much per head according to the value of the animals. At this time the average number of cattle slaughtered in New York was 400 a year; by 1694 it was about 4,000. Later an ordinance of 1749 forbade any killing outside the public slaughter house.¹⁵

¹³ DeVoe, *Abattoirs*: a paper read before the Polytechnic Branch of the American Institute, June 8, 1865, p. 7.

¹⁴ It was as follows: "We doe swere in the presence of Almighty God, that we, as sworne butchers of this city, shall kill noe cattle, hoggs, etc., without a ticket of consent from the collectors of the mayor and aldermen except it be for the Rt. Hon. Governor Richard Nicholls. So help us, God Almighty." (DeVoe, *Abattoirs*, p. 8.)

¹⁵ DeVoe, p. 9.

During the Revolution many butchers took advantage of the war to put up their own slaughter houses. This proved a blow to the public slaughter house. In order to provide for the increasing business the butchers who had early organized a trade guild in 1789 petitioned that they be allowed to kill on their own land, and if that were granted they were willing to assure the keeper the payment of his fees for the term of his office. The butchers were further willing for the council to appoint as many of them as necessary inspectors of their several slaughter houses. This petition was granted, and in this way there came to an end the system of public slaughter houses in New York.

Maryland

Maryland is sometimes called a middle Atlantic colony, sometimes a southern one. True, there was not found there the variety of economic life of New York and New England, yet on the other hand there was not the conservatism of Virginia and South Carolina. The first domestic animals in Maryland came from Virginia and towards the end of the seventeenth century most of the people it is reported "have good Tracts of Land and Stocks of Cattle and Hogs."

In 1793 the Maryland Assembly passed an act directing the purchase of 10 acres of land in or near Baltimore and the laying out of the same in small lots with proper enclosures and stalls for the cattle and declaring Thursday of every week to be a market day for the sale of livestock of every kind.

Pennsylvania

Pennsylvania, the latest of the northern colonies to be established, was fortunate in being unhampered by greedy trading companies as in New Netherland, or by a landed aristocracy as in Virginia. The prosperity of Pennsylvania was even more largely due to the solid character of its yeomen settlers and

its fertile soil. Cattle were allowed to forage at large and increased in number to such an extent that William Penn was able to open up a cattle trade with the West Indies, at the same time providing for home distribution and consumption of stock by founding two markets each week in Philadelphia, Chester, and Newcastle, and establishing two annual fairs in the colony. As a result Pennsylvania was early famous for its exports of cattle, hogs, beef, and pork products.

The packing of meats was established prior to 1729 in Philadelphia. Among the acts passed by the assembly in that year was a very long and minute one "for more effectually to prevent unfair practices in the packing of beef and pork for exportation." It directed the size and material of casks; required that they should be branded with the marks of the coopers who made them; and ordered that the contents should be inspected, after which the casks should receive an inspector's brand.¹⁶

The Quakers and the Germans rivaled each other in fattening stock. By the middle of the eighteenth century the Philadelphia market and the Pennsylvania fairs were the banner ones of their kind in America.¹⁷ Not only were herds of cattle driven down from the upper valleys in Pennsylvania to the farms near the markets, but great droves were even driven all the way from Virginia and the Carolinas.

Southern Colonies

There were cattle in Virginia before 1609 and in spite of the hostility of the Indians the livestock thrived wonderfully. This was due partly to strict measures instituted by the colonists against useless killing of livestock, and partly to the free-

¹⁶ Scharf, J. T., and Westcott, Thompson, *History of Philadelphia* (1884), Vol. III, p. 2284.

¹⁷ Gregg, *Old Cheraw*, p. 109. Turner, *Old West*, p. 221. Kalm, *North America* (1748), Vol. I, p. 54, states that the fairs were held on the 16th of May and 16th of November. The market days were Wednesday and Saturday when provisions were brought in. In summer there was a market almost every day from 4 or 5 A.M. until 9 A.M. because meats and other victuals won't keep in great heat.

dom given the cattle.¹⁸ By 1627 there were from 2,000 to 5,000 cattle in Virginia,¹⁹ though many of them were of stunted growth due to lack of proper care. Shortly after this a range system was worked out by fencing off a peninsula as large as the English county of Kent where the cattle could wander at will. The country around Jamestown formed the principal cattle preserve of the colony.²⁰ No fences or buildings were allowed on the range and it proved of great benefit to the small planter, who in this way had a boundless expanse open for his cattle. As in the later cattle ranches of the West, branding was resorted to in order to identify the cattle.

For a long period of our colonial history in Virginia, as elsewhere, the principal value attached to cattle was for their hides. The colonial assemblies passed laws encouraging the tanning of leather, prohibiting, however, its importation and even regulating the shoemaking business. Farmers took their hides to a currier to have them tanned and returned, and then let itinerant shoemakers work them up into footgear for the family. Besides this there were tanners and shoemakers who did an independent business.

Hogs in Virginia

Hogs were so numerous in Virginia that one writer states "they swarm like vermin"²¹ and they were not even listed in an inventory of an estate. They were considered of so little value at that time that the crime of stealing and killing hogs was rarely punished, for it was held that they were of no expense to their owners as they roamed about the forests and marshes. It was thought necessary as time went on, however,

¹⁸ Force, Tracts, Vol. III. One of Sir Thomas Dale's edicts ran thus: "Wee do strictly charge and command that no man shall dare to kill or destroy any Bull, Cow, Calfe, Mare, Horse, Colt, Goate, Swine, Cocke, etc., of what condition so-ever; without leave from the Generall upon paine of death and in the accessory burning in the Hand, and losse of his eares, and unto the concealer of the same foure and twenty hours whipping with addition of further punishment as shall be thought fit by the censure and verdict of a martial court."

¹⁹ Bruce, Economic History of Virginia, Vol. I, p. 202.

²⁰ *Ibid.*, p. 312.

²¹ Beverley, p. 262.

to make the hog stealer suffer for disregarding the rights of others. But instead of calling his act a felony, the law simply imposed a fine of 1,000 pounds of tobacco and in default of payment compelled him to enter for twelve months the service of the owner whose hog had been stolen. No one paid heed to this, so a later law was enacted providing that on the second offense the hog stealer should be placed in the pillory for two hours with his ears nailed to the beam and at the end of that time they should be cut loose with a knife.²² Finally, when the third offense was declared a felony, the habit of hog stealing ceased to some degree.

From our modern point of view little care was given livestock in Virginia, but, notwithstanding, the pork and beef of the colony was declared the best in America and was largely exported. Indeed, so important did the trade become that the size of the barrel was prescribed by law, and public packers were appointed who were heavily fined if they accepted unwholesome meat, or allowed it to be placed in a barrel above or below the legal size. The justices of the peace chose marks for the barrels shipped from their jurisdictions and the quantity which each contained was also stamped on the face of the cask.²³

The Carolinas and Georgia

The first livestock of the Carolinas was driven from Virginia when the settlers moved south. In the early part of the eighteenth century the cattle began to increase and the development followed of what was in colonial times regarded as the best cow country in America. This was in the uplands of North and South Carolina.

The borders in the Valley of Virginia and on the Western highlands of the Carolinas were largely engaged in raising horses, cattle, sheep, and hogs which grazed at will upon the broad

²² Henning's Statutes, Vol. II, pp. 440-441, quoted in Bruce, Vol. I, pp. 378-379.

²³ Bruce, p. 485.

slopes of the eastern foothills of the Alleghanies, most of them in as wild a state as the great roving herds now to be seen upon the semi-arid plains of the Far West.²⁴

In spite of the narrow policy of the founders of the colony, who wished to restrict the people to the cultivation on plantations of staple crops, the restless population moved inland towards the frontier where the cow-pens or ranches took the place of the log cabins of the hunters in the Piedmont region of South Carolina. A cow-pen was a rough noisy frontier settlement, often developing into a town like the later cow-towns of the western ranges.²⁵ If pasturage was good the cow-pen would remain in one place, but if population increased or pasturage decreased, the cow-pen keepers pushed ahead westward.

Careless Methods

The system, though it did bring a profit, was needlessly wasteful. The fact that the climate was mild made the planters feel that great care was unnecessary. It must be acknowledged, however, that the system did produce great herds of cattle which found a ready market either alive or as barreled beef. It was customary at regular seasons to drive the cattle to the coast towns of Charleston, Norfolk, Baltimore, and Philadelphia,²⁶ but at times the herds were sold to professional drovers who took them to town.

As in Virginia, every planter in the Carolinas had plenty of hogs. The immense quantities of acorns and nuts in the woods afforded an ample supply of food and the hogs ran

²⁴ Thwaites, Daniel Boone, p. 35.

²⁵ Logan, History of Upper South Carolina, Vol. I, p. 149, describes these cow-pens thus: "Having selected a tract where cane and pea-vine grass grew luxuriantly they erected in the midst of it temporary cabins and spacious pens. These were used as enclosures in which to collect the cattle at proper seasons for the purpose of counting and branding them. . . . A cow-pen was quite an important institution. It was usually officered by a superintendent and a corps of sub-agents, all active men, experienced woodsmen and unfailing shots at long or short sight with the rifle. For these a hamlet of cabins was erected, besides the large enclosures for the stock, all of which with a considerable plot of cleared land in the vicinity for the cultivation of corn, made quite an opening in the woods."

²⁶ Gregg, pp. 68, 110.

wild and fed on these and on peaches. As a result "no English colony on the continent was so rich in hogs and good pork as the Carolinas." When wanted, the livestock was shot, for no other way was feasible. Thousands were killed, salted, and exported to the West Indies. Pork was a valuable export from Charleston, and Cheraw bacon rivaled in the South that of Connecticut in the North.

Following the example of South Carolina, Georgia became an important cow country late in the eighteenth century and cow-pens became familiar there. As for Florida and Alabama, there is good evidence for the statement that De Soto and other Spanish explorers owned droves of hogs and that they were well known as early as 1540. It may be that in some sections the wild hogs of a later day were at least in part descended from this stock.

A Frontier Activity

Regarding livestock and meat packing in colonial America, it is well to note that very early the raising of cattle and hogs and the curing and pickling of beef and pork became of special interest and one of the chief activities of the colonists. Stock raising in every one of the colonies was primarily a frontier activity.²⁷ Even in colonial times this frontier had moved from the coast until in the middle of the seventeenth century it was at the head of river navigation or the "fall" line.

By 1700 the frontier in New England was marked by the foothills of the White Mountains and the Berkshires; in New York the edge of the wilderness was above Albany and beyond the German Flats in the Mohawk Valley; in Pennsylvania settlement was still confined to the region around Philadelphia; in Virginia the tidewater remained the frontier until the discovery of the Shenandoah Valley; in the Carolinas the frontier was barely eighty miles from the coast in 1700.²⁸

²⁷ Turner, *The Old West*, p. 185.

²⁸ Thompson, *Chap. IV*, p. 28.

After the westward movement in the eighteenth century the frontier included the back country of New England, the Mohawk Valley, the Great Valley of Pennsylvania, the Shenandoah Valley, the Piedmont, lying between the Alleghenies and the head of navigation of the rivers. Along all this frontier line cattle and hog raising and small farming were the principal enterprises. This was where the very considerable packing and curing of meats of colonial America was done, mostly by farmers, though now and then by men who made it their sole business.

The Agrarian Migration

The War of Independence brought the beginning of a new era in the agricultural history of America. The most important feature of the new period was the agrarian migration and the shifting of the center of livestock raising to the Ohio Valley. This made possible, indeed, made necessary, the rise of an organized industry of meat packing in the livestock area, with its headquarters at Cincinnati.

After the Revolution there was little beef raising in Massachusetts except in the Berkshires. Much attention, though, was given to sheep breeding, causing Governor Hutchinson to note in his "Diary" that Massachusetts was "the most sheepish of the colonies." Boston remained, however, the largest live cattle market in New England, though by this time most of the cattle sold there were raised in New Hampshire and Vermont and driven to Boston.

Connecticut became the leading stock raising state of New England and the ports of New London, New Haven, and Norwich did a big business with the West Indies in live cattle and pork products. Connecticut hams were the most famous in the North.²⁹ The center of stock raising was Hartford.

²⁹ Coxe, *View of the United States*, p. 92, states that the name "Connecticut" was given to all the pork of Pennsylvania and New Jersey. "Burlington" was the term applied to pork north of Jersey. Both, Coxe says, were fully equal to the pork of Ireland and Brittany and much cheaper.

Atlantic States More Settled

In the main, however, New England developed a more settled agriculture. And the same was true of the middle states. It was in the middle states that during the Revolution distinct impetus was given to the preserving of beef in America. Owing to the American blockade of New York, not enough cattle could be got and a great deal of English corned beef, then a novelty, was imported in casks of 112 pounds each. The papers of the time, for example, the *New York Gazette* and the *Royal Gazette*, refer to it in advertisements as "the best London beef preserved by the new method, with saltpeter, spices, etc."³⁰

As to the meat trade in general, in New York City there was still a vicious combination of the butchers which controlled prices, the farmers protesting against this monopoly. At this time also the New York markets were "very much inferior to those of Philadelphia," probably because of their inaccessibility.

The opening up of the rich Genesee country just before 1800 represented a very significant advance of the frontier. What is now central New York and the lake region became settled at that time. Many of the pioneers of the Genesee Valley were New Englanders who brought livestock with them. However, they did not slaughter, nor sell their cattle for some years, wisely preferring to build up their herds. They lived on pork and when the Erie Canal was put through, 1817-1825, they were able to supply the thousands of canal workers and in addition were able to send great numbers of cattle into eastern markets on the completion of the canal.³¹ It was in supplying these demands that Buffalo first emerged as a meat packing and livestock market center. A few years later there is a record of hundreds of steers being slaughtered in Buffalo

³⁰ *New York Gazette*, June 21, 1779, and *Royal Gazette*, October 13, 1779, quoted by Thompson, Chap. V.

³¹ Thompson, Chap. V, p. 17.

for the English market and of the beef being salted, pickled, or packed.³²

Pennsylvania Stock Leader

Pennsylvania continued to hold its leading position in agriculture and animal husbandry. The best stock farms in the United States were in the counties around Philadelphia. It was a paradise for the fat cattle raiser. Buying lean cattle and fattening the same was a profitable business. Because of this, Philadelphia was a great export place for beef, pork, and dairy products.³³ Baltimore had the same kind of trade, though in a less degree, her chief exports being Maryland and northern Virginia pork products.³⁴ In the first two decades of the nineteenth century the Pennsylvania farmer began to fatten western cattle. The Germans still clung to hog raising, but few others did so on a large scale as the bulk of the hogs in time came from the West. An interesting note of the period is that until 1825 in both New York and Philadelphia hogs ran at large in the streets as scavengers.³⁵

After the Revolution, Virginia continued its shiftless methods of farming and livestock raising. The planters raised just enough corn for their own needs and to an extent those of the cattle, though the latter often had to eke out this fodder in the late winter by hunting their food in the woods. Many cattle died and some became wild.

Hogs were so numerous that they became a nuisance. If the planters had raised more corn they could have fattened these hogs sufficiently to make Norfolk rival Philadelphia and Baltimore as a place of export for ham, bacon, lard, and pork products. However, the planters were indifferent to the possibilities. When hogs were required for food they were shot, this being their only means of securing them. Often the planters amused themselves with the sport of pig-shooting.

³² New York State Agricultural Report, 1843, p. 442.

³³ Travels of the Rochefoucauld Liancourt, Vol. II, p. 367.

³⁴ Schoepf.

³⁵ DeVoe, Market Book, p. 481.

South Still Wasteful

Wild cattle and hogs also roamed the woods in the Carolinas. Huge droves of these were driven at intervals to Charleston, and even larger numbers to Baltimore.³⁶ As these hogs fed on mast and acorns and produced bacon which was soft and did not keep well, and the lard was thin, Carolina hogs were often corn-fattened in the North for marketing. Also since the South raised little corn the cattle were not fattened before killing and the butcher's meat in Charleston was neither fat nor of good taste.³⁷ Though this was a most careless method of stock raising the profits were large, for with the exception of the cost of driving to market and a few weeks' fattening, the expense was negligible.

Stock raising then and the preserving of meats for export continued to be an important activity in the period succeeding the Revolution, but it was done chiefly by the planters and farmers and very few people made their sole business that of meat packing. Most of the trade was with the West Indies, as the colonial custom books show. For example, in 1770, 244 barrels were shipped to the south of Europe, while there were sent to the West Indies 2,870 tons of beef and pork, making about 28,944 barrels valued at £66,035, or \$277,000.³⁸ In 1770 there were 185,143 pounds of tallow and lard exported; in 1804, 2,565,719 pounds of lard and livestock. This trade which fluctuated, of course, according to the opportunities for commerce during the wars in Europe, was fostered by bounties granted by Congress.

Improving Sheep

Several changes came into agriculture with the nineteenth century, most important of which for stock raising was the importation of Spanish merino sheep. Jefferson, Madison,

³⁶ Smyth, *Tour I*, p. 263, mentions seeing hogs in droves of one, two, and even five hundred along the Virginia roads from the back settlements going to the coast.

³⁷ Schoepf, *Vol. II*, p. 189, quoted in Thompson, *Chap. V*.

³⁸ Pitkin, *Statistical View of the United States (1817)*, p. 124.

and Washington were all interested in this and they imported quite a number. The first importer, however, was Colonel David Humphreys of Derby, Connecticut, who was Minister to Portugal, 1790-1794, and then to Spain, 1797-1802. He sent a small flock from Spain to Connecticut in 1802.³⁹ Another man, Chancellor Livingston of New York, American Minister to France in 1802, brought over to America a merino ram and two ewes from a flock belonging to the French government. Later, in 1812, he wrote his "Essay on Sheep," the earliest American work on the subject. William Jarvis, United States Consul at Lisbon, established a merino flock in Wethersfield, Vermont. All New England profited as a result of sheep importations, but Vermont became the banner state. Later the scattering of the flocks of Spain because of the political turmoil there led importers to turn to Saxony. Then arose a wave of speculation culminating in the "Merino Bubble" burst, with the result that sheep raising did not get on its feet until 1830. At this period interest in sheep was more on account of wool than mutton, for it was not until much later that Americans began to eat mutton to any great extent.

From the writings of the time it is clear that in the second and third decades of the nineteenth century the colonial methods of stock raising were no longer practicable in the Atlantic states. The forests no longer yielded unlimited herbage for stock which wandered at large. In many places the forest was a resource for but two or three months and in other places not at all. Yet the farmers foolishly tried to keep the same number of cattle on their farms as they had on the unenclosed pasture. The result was poor and unprofitable cattle.

Stock Raising Moves West

Such was the situation after the War of 1812 when, in Channing's phrase, "the American people . . . addressed itself to the solution of the problem of the nineteenth century,"

³⁹ Patent Office Report, 1854, p. 28.

namely the settlement of the "New West," or the country beyond the Alleghenies. It was necessary to find a new region for settlement and for stock raising. The mountains no longer served as a frontier. The frontier and the cattle and hog country had preceded civilization westward. Professor Thompson says :

This New West was composed of three sectors, each with definite physical boundaries: First, the North West, between the Great Lakes and the Ohio River; second, the Central West, the territory south of the Ohio River and in the Valley of the Tennessee River; third, the South West, from the south side of the Tennessee watershed to the Gulf. The North West was the west for western New York and Pennsylvania and part of Virginia; the Central West was the west for Virginia especially, but also in some degree to upland Carolina; the South West was the west for the Carolinas and Georgia. The states of Ohio, Indiana, Michigan, Illinois, and Wisconsin have been carved out of the first; Kentucky and Tennessee out of the second; Alabama and Mississippi out of the third. In general it may be said that the population of New York, Pennsylvania and the upland south overflowed into the North West; that of Virginia into Kentucky and Tennessee; that of the Carolinas and Georgia into Alabama and Mississippi.

Prior to the Revolution pioneers had gone from Virginia and the Carolinas into Kentucky and Tennessee. As a result of the treaty of Fort Stanwix made with the Indians in 1768, the country west of Virginia—the Kentucky and Tennessee of today—was a neutral zone. The Kentucky, the Cumberland, and the Tennessee rivers were natural ways to this rich region, and so about the beginning of the Revolution there were several little settlements in Kentucky at Louisville and in Tennessee at Nashville. By 1790 there were 100,000 people in Kentucky.

Kentucky Improves Cattle

The Kentucky farmers began early to give attention to bettering the breed of cattle. In 1783 Messrs. Goff, Ringold, and

Patton of Baltimore imported some pure short-horn cattle from England to improve the breed in the United States, and in 1785 a son of this Mr. Patton took a bull from that importation to Clarke County, Kentucky. Mr. Patton, Senior, some time later followed his son, taking with him another portion of the same lot of stock. This old bull, then aged 18 years, was sold at auction for \$133.33. It is from these cattle that the famous "Patton stock" came.⁴⁰ In 1817 an importation of three bulls and three heifers, probably Durhams, was made by Colonel Lewis Sanders of Lexington, Kentucky, followed shortly by several others. These were interbred among themselves and into the Patton stock and laid the foundation of many valuable Kentucky breeds. In 1816 two pairs of Hereford cattle were imported into Kentucky by Henry Clay and taken to his farm near Lexington.

The settlement of the country north of the Ohio River was later than that of Kentucky, though there had been a French occupation of the Ohio-Illinois country and during that period settlers made considerable progress. They had large herds of hogs and black cattle, and from the Wabash posts in 1746, 600 barrels of flour were shipped to New Orleans. Salt beef, tallow, flour, and pork were regularly sent to New Orleans.⁴¹ However, it was a considerable time before the Ohio country, as compared with Kentucky, was thought of as a good cattle region.

Ohio Valley Cattle Raising

After the Revolution the Ohio Valley was settled, at first mostly from Pennsylvania. "As has been pointed out the majority of the settlers came from the Upland South. As the Ohio Valley as a whole was an extension of the Upland South, so the Upland South was, broadly speaking, an extension from

⁴⁰ United States Agricultural Report, p. 296. (H. Exec. Doc., Vol. XV, 1866-1867.)

⁴¹ Benton, *The Wabash Trade Route*, J. H. U. Pub. XXI, p. 24.

the Old Middle region, chiefly from Pennsylvania."⁴² Pioneers from this Upland South often brought their cattle with them, but those from more remote points like New England of course did not.

In 1794 two events occurred which greatly stimulated the settlement of the Ohio country and gave an impetus to cattle raising. The first was the elimination of the Indian menace in the Northwest after the battle of Fallen Timbers on the Maumee (August 20, 1794) and the treaty of Greenville, which shifted the Indians further west. The second event was the Whiskey Rebellion in western Pennsylvania. In that state the farmers had found that the best way to convert corn into a marketable commodity was to manufacture home-stilled whiskey. This could be packed in small kegs and taken to the coast at great profit. At that time it was not thought possible to feed corn to cattle and hogs and drive the livestock from so far in the interior to the seaboard with profit. For a time the farmers had disposed of their surplus livestock by floating the cattle and hogs down the Ohio and Mississippi rivers to New Orleans, then a Spanish town. It took a long time, but was a cheap method and the stock sold for \$12 per hundredweight.

The establishment of an internal revenue system and the placing of an excise tax upon whiskey deprived the farmer of the right to convert corn into whiskey, so he had to turn his attention to the raising of cattle and hogs, which soon increased so fast that the New Orleans market was glutted and another way had to be found to get rid of them. Between 1815 and 1830 Ohio was the cattle and hog raising country of the United States.⁴³ By 1830 it had ceased to be characteristic of frontier conditions.

⁴² Turner, *The Ohio Valley in American History*, *loc. cit.*, pp. 38-39.

⁴³ Some prices of this time are given in Holme Journal, in Cobbett, Pt. III, p. 105, near Zanesville, in 1818: Beef, per 100 lbs., \$4; pork per 100 lbs., \$4; live hogs per cwt., \$3; cows (best), \$18. Melish, *Travels* (1819), p. 401, near Lexington, Kentucky: Beef, 3 cents per lb.; mutton, 83 cents per side; veal, 81 cents per side. Faux, *Travels* (1819), p. 197, near Lexington, Kentucky: Beef, best cuts, 6 cents; common cuts, 3 cents; whole fat mutton, \$2.50. *Ibid.*, p. 180, Indiana: Beef, pork, 4 cents per lb.; bacon, 10 to 12 cents.

Indiana and Illinois

Indiana and Illinois in 1830 were in the same condition that Ohio was in 1810. Of the three states Indiana, even in its pioneer days, was never as good a stock raising country. For this there were many reasons. It was more heavily wooded; the southern part was hilly and broken, the northern part marshy. The population in its early history was lawless, in fact notoriously so. Even an Indiana judge was suspected of stealing hogs and shipping them on flat boats to New Orleans. Further, since Indiana was too far away from eastern markets to make droving profitable, the market for her cattle and hogs was restricted to the river trade, and to Kentucky. Besides, the first Indiana legislature by the laws it passed did not give settlement the proper encouragement. On the other hand, the pioneer history of Illinois is very much a repetition of that of Ohio twenty years earlier.

The Illinois prairies were ideal for grazing and about the only attention given the cattle was salting them from time to time. By 1818, when Illinois became a state, it was in the stage of extensive cattle raising. The cattle ran at large, with the hogs feasting on the prairie grass and nuts. Still, cattle rearing was a business of limited possibilities. Droving as far as the eastern markets was impossible, though some Ohio drovers came over to Illinois to buy cattle. New Orleans was the great market. However, Illinois had the competition of the down-river trade in cattle, beef, hogs, salt pork, ham, bacon, etc., to compete with, and the New Orleans market was likely to be often glutted. Cattle raising on a big business basis did not obtain until the opening of the railroads brought quicker and greater transportation.⁴⁴ As for sheep:

In spite of the fact that sheep could not be kept upon the prairies without considerable attention, especially during the winter months, the industry rapidly gained favor among the farmers. Heavy losses were at first experienced, due chiefly to

⁴⁴ Thompson, Chap. VI.

mismanagement, for the animals usually purchased in western New York or Philadelphia were driven the entire distance during the hot summer months or the colder ones of autumn to a new home where scarcely any provision had been made for their sheltering. As a consequence many died.⁴⁵

Missouri

The last state to be considered is Missouri. The French had had settlements there, for example, at St. Louis, but though cattle and hogs ran wild it was never, except incidentally, an agricultural region. As the states on both sides of the Ohio filled up, the surplus population overflowed soon into Missouri. After the War of 1812 the hard times in New England and elsewhere drove thousands west. The rapidity with which Missouri was peopled was remarkable. The lure was the same as Kentucky, namely, rich prairies and cane along the rivers.

Stock raising was largely followed in early Missouri and it was quite the equal of Illinois and Ohio. Indeed in one particular it had a great advantage in accessibility to market, for flatboats bearing livestock, beef, and pork products could start earlier for New Orleans than from places along the Ohio and the voyage could be made more quickly. The Missouri stock raisers also found a close market in the lead and zinc mining colonies in the state and army garrisons.

While there was considerable progress in extension of population half-way across the continent, the further development of the middle west states was held back by the lack of transportation facilities. In the earlier years most of the settlers' transactions had been upon a barter basis, and horses, cattle, and hogs were often exchanged for groceries and other store goods. Indeed transportation was so meager that for a time in the interior it was hardly worth while to have a surplus of anything. The people in the frontier parts had all the livestock they wanted, and generally speaking the value of the

⁴⁵ *American Agriculturalist*, Vol. IV, p. 247, quoted from Pooley, *Settlement of Illinois*, pp. 549-550.

animals depended more upon their immediate utility to their owners than on the cash into which they could be converted.

Westward Movement Pauses

After the admission of Missouri the westward movement paused. It is time to consider what breeds of livestock were being introduced into this Middle West, the methods of marketing, and the distribution of these raw materials of the meat packing industry which began in this period in a small way in many villages and towns in Ohio, Kentucky, Indiana, and Illinois, and which, especially in Cincinnati, attained very great development by the Civil War.

By commonly accepted license reference has been made to the "packing industry" as that industry which prepares the various kinds of meat for market. As a matter of fact, "packing" comprises today the very smallest portion of the whole meat industry, and it has always held a relatively unimportant place. In early times meat was preserved by drying in the sun. A step removed from this was the later method of smoking the meat so as to hasten the drying process. Then various ways of curing hams in addition to smoking were discovered. Sometimes smoked meats were shipped in barrels, but ordinarily they were shipped as "bulk" meat. With the increased demand from abroad for American meats, together with the demand from the southern plantations for meat for the negroes, and from the seagoing vessels for pickled meat to supply their crews, the real business of "packing" began. Dried and smoked meats would not do for these classes of consumers, and therefore pickled meats came into use to satisfy them. Very large quantities of "bulk" meats were prepared every year, and although a very small portion of these were barreled or packed, we must include them in any consideration of the packing industry, just as today the "packers" ship in refrigerator cars the greatest portion of the meat which they have slaughtered, and "pack" only a negligible portion.

CHAPTER II

LIVESTOCK IN THE MIDDLE WEST—1830-1870

Changes in Stock Raising

Early conditions surrounding the meat packing industry, whose progress has been traced to the Middle West, were very much the same everywhere and did not change radically until about 1870. However, in the three decades before the Civil War there were great changes in the extent of the cattle and hog raising country through the addition of Michigan, Iowa, Nebraska, and Kansas, which introduced the highly important factor of free or cheap land, and by the revolution in the agricultural system from the old woodland agriculture to the new order of farming with its new methods of tillage, use of artificial fertilizers, foreign breeds of cattle, new crops, and new machinery and implements, as grain cradle, mowing machine and reaper.

Other contributing factors influencing the revolution were the rise of agricultural periodicals and farm literature, the building of the railroads, a tremendous development of transportation and markets, and the work of the federal government in establishing an agricultural bureau and in enacting the pre-emption law of 1841 which guaranteed land titles to settlers. These culminated in 1862 in four far-reaching events, the establishment of the Department of Agriculture, the founding of the land-grant colleges (Morrill Act), the federal charter of the Union Pacific Railroad, which was completed in 1869, and the Homestead Law.

All these movements were modifying factors conditioning

the history of American livestock, but the one influence which is the most important and direct was the importation of foreign breeds and their growth in America.

Creating the Modern Hog

The most thoroughly American domestic animal is the American hog. And of the different types much more attention has been given to the lard type than to the bacon type of hog. The American hog raiser improved his hogs to a greater degree than was the case in cattle and sheep. He did not import whole herds of blooded stock, but was content to use the mongrel sow of colonial ancestry as a base upon which he crossed imported Chinese, Neapolitan, Berkshire, Tamworth, Russian, Suffolk, Black, Byfield, and Irish Grazier boars. These importations began as early as the second quarter of the nineteenth century.

In the creation of the modern hog the object has been to produce an animal which would put its flesh on its sides and quarters instead of running to bone and a big head. The effort of the breeder has been to elongate the intestine of the hog so as to make him more able to transmute into meat and fat the corn which he consumed.

The English Berkshire hog was developed from the old English hog, the Chinese, the Siamese, and the Neapolitan. This is one of the oldest of the established breeds, but is comparatively recent. Even in the forties in England there were complaints as to the reversion of Berkshires to the older type. The Bedford hog was introduced into the United States by a Mr. Parkinson, an Englishman living near Baltimore, at about the beginning of the nineteenth century. In Massachusetts and New York it was known as the "Woburn" hog. The Byfield was originated about 1838 by a farmer in Byfield, Massachusetts, who by chance found in the market a hog of remarkable appearance, of great size, white, with heavy lopped ears, flat-sided, but of great length. Crossed with the Russian

and Chinese the improved Byfield founded a breed popular in New England and in Ohio.

The ancestors of the Irish Graziers were brought from Ireland by Irish immigrants. When crossed with the others mentioned they produced a good all-round hog notable for its ability to thrive on grass, refuse, garden truck, and potato peelings. They were white in color, with a few black spots and upright ears. Their stock later gave to the Poland Chinas their fine coating and symmetry of form.

Results of Crossing Breeds

The result of the crossing of these breeds was several genuine American breeds of hogs, such as the Chester White, first bred in Chester County, Pennsylvania, the Poland China, greatly valued in the Ohio Valley states and the Jersey Red, or Duroc breed, which furnished heavy pork for the West India trade. In northern Indiana a popular variety of white hog called "Victorias" were thought to be even finer than the Chester Whites. Most popular of all, however, was the Poland China breed which held the place among hogs that the Shorthorns did among cattle.

For the period preceding the Civil War it is difficult to get accurate statistical data. Fortunately, however, the matter was the subject of special study during 1900 and the results were published at that time.¹ The importance of the development of hog raising in the Middle West is seen in the statement made in 1849 that the value of the pork grown in the United States at that time was nearly or quite three times the value of the cotton.²

Changes in Hog Regions

From 1840 to 1860 the number of hogs increased in number, but decreased in proportion to the population of the United

¹ Monthly Summary of Bureau of Statistics, United States Treasury Department, February, 1900, p. 2279 *et seq.*

² *Prairie Farmer* (1849), Vol. IX, p. 14.

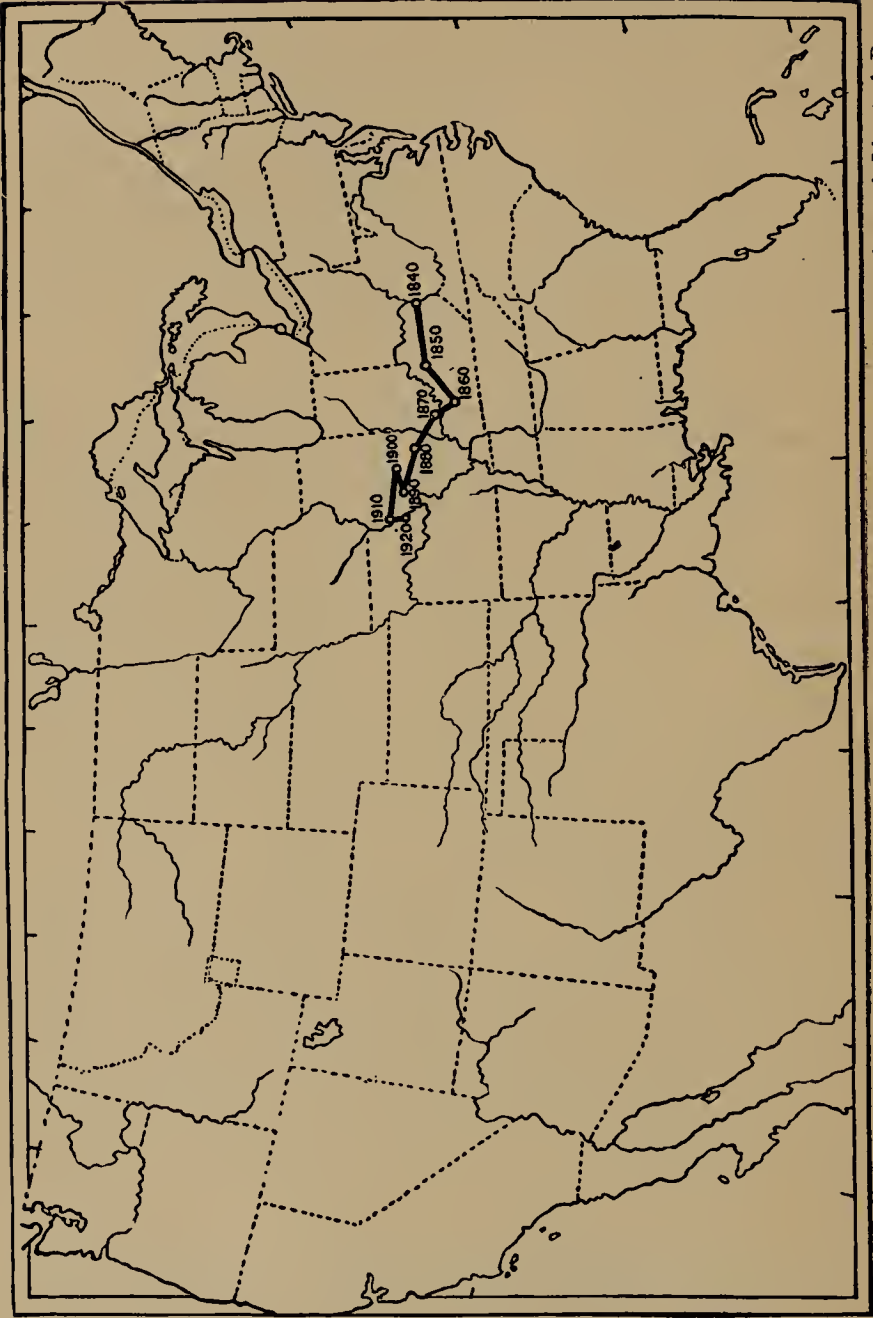


Figure 2. (a) Map Showing Change in Center of Hog Production, 1840-1920
 Courtesy Armour's Livestock Bureau

States. In 1840 there were 26,301,293; in 1850, 30,354,213, and in 1860, 33,512,867 in the United States. For every 100 inhabitants there were 154 hogs in 1840, 131 in 1850, and only 107 in 1860.

The change in the location of the hog raising industry was similar to that of the change in corn production. Thus as early as eighty years ago the number of hogs in New England began to decline rapidly.

In the middle states, as in New England, the decline was most rapid in the decade between 1840 and 1850 and occurred in each of the states of this group, being especially marked in New York.

In the west central states (Ohio, Indiana, Illinois, Michigan, Wisconsin, Kentucky, Kansas, Nebraska, Iowa, Missouri, and Minnesota) there was a considerable increase in the number of hogs from 9,252,000 in 1840 to 14,435,000 in 1860. Changes were evident here, however, the trend being towards the west. The greatest hog raising section during this period from 1840 to 1860 was in the South. This district (comprising Alabama, Arkansas, Florida, Georgia, Louisiana, Mississippi, North and South Carolina, Tennessee, Texas, and Virginia) contained in 1840, 46 per cent, in 1850, 52 per cent, and in 1860, 46 per cent of the total swine of the country. The comparative decline in hog raising in the South since 1850 has been one of the most strongly marked features of the development of this industry in the United States.

The development of hog raising from 1850 to 1860 is in many ways similar to that which has occurred in more recent times, the number of swine decreasing in a district as the population increases. The comparatively high value of hogs per given bulk renders them capable of being transported a long distance and makes it more profitable to raise them where land is cheap, even if the distance from market be greater. On the other hand, this tendency is partially affected by the fact that hog raising is an industry which is naturally carried on upon a

small scale, as the hog is the means of utilizing and converting food matter and waste which would otherwise be lost. The advantage of having a few hogs upon each farm has, therefore, retarded the tendency of the westward movement, but has not entirely nullified it.

Early Hog Habits

A greater contrast can hardly be imagined than that presented by a comparison of the hogs in the Middle West a century ago with those of today. Whatever breed they might previously have been, the prevalent system of allowing all "domestic" animals to run wild in the woods soon caused any distinct strains to be lost in the mixed swine of the country. Such nondescript animals were typical of the frontier and were, indeed, the only kind of hogs that could thrive under the conditions imposed by the wilderness. It is quite possible to trace the advance of the frontier by noting the kind of animals which the settlers raised. The descriptions of the stock of Illinois in 1820 correspond very closely with the reports of the previous decade which tell of the Ohio hogs, or with those regarding the hogs in the western portion of Virginia and the Carolinas at an earlier day. The stunted cattle and lean hogs of the mountainous regions of Tennessee, Missouri, and Arkansas at the present time are direct lineal descendents of those which constituted the frontier farmers' only stock. Animals of this type continue as long as the conditions which produce them remain.

The pioneer hogs of the West were long and slim, long-legged and long-snouted, "slab-sided," large-boned, gaunt-bodied, flap-eared, with arched back and bristled erect from head to tail.³ The various names with which the settlers aptly christened them tell what they looked like better than could be indicated by any extended description. They were "painters,"

³ History of Madison County, Ohio, p. 473. *Union Agriculturist and Prairie Farmer* (April, 1841), Vol. I, p. 31.

"rovers," "sappling-splitters," "wind-splitters," and "razor-backs."⁴ They were of medium size, their hard usage making it impossible for them to gain any great weight.

In the early days hogs were reared most extensively in the thinly settled regions, where they could roam at large over wide tracts of forest. Every farmer had at least a few, and it was not uncommon at a very early date for one person to have from 60 to 100 running in the woods. As the region grew more prosperous, the number of hogs possessed by a farmer became one of the indices of his wealth, and the immense droves raised would seem incredible to one not familiar with the facts.⁵

How Hogs Were Fed

Hogs required a minimum amount of care and attention from their owners. During the spring and summer the farmer looked after them only occasionally to ascertain what range they were frequenting and to mark the recent litters by cutting their ears. Every farmer had a separate mark which was recorded in a book kept by the county clerk, and the laws placed very severe penalties on those who cut off the ears or altered the marks of hogs or cattle belonging to others. These marks were, of necessity, very intricate, forming a great disfigurement to the animals.⁶ Bears, wolves, and wildcats, not infrequently committed depredations on the herds, but the loss from this source was of too little consequence to induce the farmers to enclose their fields. Wild roots, vegetables, berries, and the native grasses which flourished in great profusion, provided abundant forage during the summer.⁷ When these disap-

⁴ Porter, Gannett, and Jones, *The West in 1880*, p. 309.

Prairie Farmer (April, 1842), Vol. II, p. 34. "Pigs are of various sorts," says one writer, "but many are of sandy color and some with wattles, a piece of flesh two and one-half inches thick, growing out of their cheeks."

⁵ Robert Baird, in his "View of the Valley of the Mississippi" (p. 207), says, "Many farmers in ordinary circumstances raise annually several hundred hogs, a hundred cattle, and ten or twenty horses."

⁶ Hall, James, *Notes on the Western States*, p. 146.

⁷ Faux, *Memorable Days in America* (p. 228), says, that as consequence of being confined too much on this food, some of which was ill-favored and poisonous, beasts not infrequently died suddenly in the fall. Fordham (p. 221) describes the wild strawberries as so abundant that they dyed his horse's fetlocks like blood.

peared in the fall, however, the hogs often had a hard time finding a living. With the falling of the "mast"—hazel and hickory nuts, acorns, and beech nuts—the hogs thrived better, and in a good year fattened rapidly, becoming quite large.

Hogs fattened entirely upon wild nuts, however, even when they became of remarkable size, were not in fit condition for market. Mast-fed hogs produced pork, which, while not deficient in sweetness of flavor for immediate use, was soft, oily, and hard to preserve.⁸ Such pork, of course, could not pass inspection at New Orleans.⁹ For this reason hogs were driven home in the autumn and fed on corn for a period of from three to six weeks before they were taken to market. During this time, although they did not become any fatter and did not increase appreciably in weight, their flesh became solid and their lard white and firm.¹⁰ Most of the advertisements of pork packers during this period expressly stated that only "good corn-fattened" hogs were desired. The difference in value between the pork fattened in the woods and the corn-fed pork is shown by the scale of prices of the early days. In 1817, \$3.50 and \$4 were the prices paid respectively for the two grades of pork.¹¹ The same distinction manifested itself in prices as late as 1837, when mast-fed pork was selling at New Orleans at \$3 per hundredweight and corn-fed pork at \$4 to \$5.¹²

Corn the Later Hog Feed

As the clearing of the wilderness increased the amount of cultivated land, farmers depended less on mast and more on corn to fatten their hogs. The cost of raising corn lessened as the tillable acreage increased, and in a short time corn began to be raised in very large quantities. With this came the

⁸ Faux, *Memorable Days in America*, p. 259. He adds, "When boiled, the fat became oil and ran out into the water, and the bacon would drip all summer."

⁹ Mitchell, *Illinois in 1837*, p. 42.

¹⁰ Hall, James, *op cit.*, p. 148.

¹¹ Fordham, *Personal Narrative*, p. 118.

¹² Mitchell, *op. cit.*, p. 42.

realization that it was more profitable to transform the corn into pork and let it "walk to market" than to carry the corn to some river town for shipment or to distill it into whiskey. As early as 1831, the size and appearance of the hogs at Cincinnati was taken as the index of the corn crop, and packers rejoiced "that the farmers begin to be more sensible than formerly that the best way of disposing of their corn is to use it to increase the size of their hogs, so as to command the highest prices."¹³ Mast continued, however, to be an important element in pork production as long as the woods remained. During the season, 1854-1855, "but for the superabundance of mast in the Western States, the deficiency in the supply of hogs would have been still greater than it actually proved to be."¹⁴

The necessity of proper feeding in order to prepare hogs for market gave rise, in some cases, to a special class of men called "feeders," who purchased the hogs wild upon the range and took them to a convenient place near the market, where they fed them on corn for a period sufficient to put the pork in such condition that it would pass inspection at New Orleans. Another class of feeders engaged in the business, not to provide better pork for the market, but to afford an outlet for an otherwise useless by-product. These were the distillers, who utilized the "mash" of the corn and rye left in the distilling of whiskey as a food for fattening hogs. "Still-fed" hogs constituted, indeed, a not insignificant portion of the whole number marketed in a single year.

Early Emphasis on Weight

Two hundred pounds was considered a very fair weight for a razor-back, although if well kept the same hog might have been twice as heavy. Moreover, it took two or three years for the hog of the wilderness to attain even this weight,

¹³ Edwardsville, *Illinois Advocate*, Dec. 23, 1831.

¹⁴ *Alton Weekly Courier*, March 15, 1855. The production of hogs in Ohio was 20 per cent and in Kentucky 30 per cent less than normal.

whereas a hog raised with proper care would have been ready for the market in 18 months. The prices paid by packers were almost universally graded according to the weight of the hog, a heavy animal often commanding double the price per hundred pounds that would be paid for one of light weight. This method of grading pork, which was very different from that which we find in the packing business today, was due to at least two causes. The general supposition was that light hogs were those which had been fed in such a way that their pork was not of the highest quality, and, in the second place, "clear pork," for which the highest prices were obtained, could only be made from the largest hogs.

This pecuniary incentive, coupled with a growing appreciation of the fact that the hogs which cost the least to produce were not the most profitable to the raiser, caused a gradual improvement of the stock. The agricultural societies, which speedily sprang into existence as the counties became more thickly settled, contributed their share to this movement, and in at least one instance a packer sold the farmers a lot of extra fine hogs he had just received instead of devoting them to the knife and barrel. By 1840 the tendency toward improvement of the breeds of stock was very manifest, and another decade witnessed the passing of the hog of the wilderness.

Lighter Hogs Come into Own

One of the most common bits of news in newspapers and agricultural periodicals for many years was a statement regarding the size and weight of some certain animal, or the average weight of a drove of animals, which had just been marketed. This emphasis on size furnishes a good indication of the gradual improvement of the breeds of hogs along lines which would produce a larger animal. On the other hand, this continued mention of the largest animals marketed was, no doubt, one of the means of fostering a healthy rivalry among stock raisers which could not but be beneficial to the industry. The wide

use of lard oil for illuminating and lubricating purposes during the fifties and sixties made the demand all the greater for large, fat hogs. But with the substitution of coal oil for lard oil for the former purpose in 1870, packers began to look forward to a time when but comparatively few very large hogs would be required, and when young hogs of light weights, for the making of hams, light sides, and pickled pork, would be most in demand.¹⁵

The problem of getting the hogs to market was solved by the farmers in two different ways, the distinction consisting in the possession, or lack of vitality on the part of the hog. Pork was either delivered "on the hoof," or the packer received it already slaughtered and dressed. Butchering was often done at the farm, the neighbors being called in to assist. After reserving a sufficient supply of pork for his winter's use, the farmer would take the remainder to the nearest packing point. Farmers were often not sufficiently careful about allowing the pork to become properly cooled before putting it on the wagons and taking it to market. Such precautionary acts as the fastening of the dressed hog by means of two sticks, so that the air might have free access to all exposed portions of the carcass and prevent a tainting of the meat by aiding in the rapid removal of the residual animal heat, were frequently overlooked.¹⁶ Home-dressed pork was not likely to be as carefully cleaned as that slaughtered in the city, and even if in good condition at the start of the journey, it could not be taken very far without getting more or less dirty. The carcass was sometimes cut in the wrong places owing to the farmer's ignorance of the exact methods employed by the packers, and if the pork was brought to town in cold weather, it was pretty certain to be frozen, a condition which packers especially wished to avoid. For these reasons, as well as for the fact that the bad roads and long distances often greatly reduced the farmer's

¹⁵ Transactions of the Illinois State Agricultural Society (1870), Vol. IX, p. 97.

¹⁶ *Union Agriculturist and Prairie Farmer* (Nov., 1841), Vol. I.

profit, the practice of taking dressed hogs to market for the use of the packers gradually declined. At Cincinnati, for example, in 1826, the total number of "wagon hogs," as these were called, was estimated at 25 per cent, while in 1843 the number was less than 10 per cent of those brought to that market.¹⁷

Driving Hogs to Market

The method usually employed of getting hogs to market was to drive them there. The great difficulty in driving hogs in the wilderness of the earliest days probably somewhat retarded the growth of the stock raising industry, and the long distances to the market certainly prevented any but the very strongest hogs from making the journey.¹⁸ The active life of these wilderness animals, however, made them just the kind which could undergo the fatigue of the journey without too great a loss in weight. The fattening bestowed on these hogs only enabled them to run so much the faster. The sluggishness, which is the characteristic of the carefully bred hog of today, was the one quality to which the wilderness hog never could lay claim. Whenever animals were wilder than usual they were enticed into a pen, and after being caught their eyelids were "stitched." Although thus blinded, the hogs were able instinctively to keep to the road, and upon reaching their destination a clip of the scissors set things right again.¹⁹ Two or three days on the road made the hogs quiet enough to be driven along the highway without much trouble, 8 or 10 miles being the average day's journey. Farmers with large droves often took their own hogs to market, while small farmers generally united their droves for safety and convenience. But by

¹⁷ Drake and Mansfield, Cincinnati, in 1826 (p. 77) say that in the three months between Nov. 15, 1826, and Feb. 15, 1827, 40,000 hogs were packed at Cincinnati, of which 10,000 were country killed. At Cincinnati in 1834-1835, only 10,000 out of a total of 162,000 hogs packed, were "wagon hogs." (*Alton Telegraph*, Feb. 3, 1836.) The *Alton Telegraph*, Feb. 25, 1843, states that 25,000 out of a total of 233,987 hogs packed at Cincinnati were slaughtered by the farmers and brought in wagons to that city.

¹⁸ *Union Agriculturist and Prairie Farmer* (1841), Vol. I, p. 5: "Hogs to travel well should have a straight hind leg, with muscle large and full, quite down to the hock or knee joint. With this shape any hog that is free from bruises will travel the required distance."

¹⁹ History of Madison County, Ohio, p. 473.

far the largest number of hogs were brought to market each year by drovers, who constituted a special industrial class created by the necessities of the trade. In good years this was a very profitable business.

These drovers who took cattle also across the Alleghenies from the Ohio Valley, drove large numbers of hogs to eastern markets. Some of these drovers had as many as 5,000 hogs. An estimate puts the number of hogs annually driven east from Kentucky at over 100,000.²⁰ Some of these drivers from Kentucky went into Virginia, the Carolinas, and Tennessee. In 1828 the value of livestock passing the turnpike gate at Cumberland amounted to \$1,167,000.²¹ With the rise of the pork packing industry of the West, however, the necessity for driving over such long distances ceased.

Early Improvements in Cattle

The earlier efforts of American farmers after the Revolution and in the first decades of the nineteenth century to improve the breeds of cattle have been mentioned. Although some cattle were imported in 1783 and 1785, they were not of a highly developed breed, for the English Shorthorns were hardly in existence then and the fame of the Devons and Herefords was local. The Patton stock of Maryland, Virginia, and Kentucky represented two kinds of cattle, one of them the "beef breed," which was an early example of Shorthorns, the other, "the milk breed," representing the Longhorns. These attempts, however, were made by enterprising and far-sighted individuals.

It was not until after the War of 1812 that increased and general attention was given to stock raising all over the United States. In Massachusetts the Society for Promoting Agriculture offered a premium for a thoroughbred Shorthorn bull. As a result one was brought over in 1817. The same year

²⁰ Turner, *Rise of the New West*, Chap. VII, p. 101.

²¹ Emigrants and Travellers, *Guide to the West* (1834), p. 194, quoted in Turner, *op. cit.*, p. 101.

Colonel Sanders of Kentucky imported a few cattle, some of which were Shorthorns. These had a great effect on stock raising in Kentucky and Ohio. Henry Clay imported some Herefords and these also attracted great attention. From this time on importations from England became common, and certain men acted as regular importers. In 1824 Mr. Powell of Philadelphia began this work of importation, being the first systematic breeder of Shorthorns in the United States. Much of his stock was sold to Kentucky and Ohio farmers.

Importing English Cattle

In Ohio, which was now the great cattle raising state, the cattle men took advantage of the situation, and in 1834 Governor Allen Trimble, together with Renick and General Duncan McArthur, formed the Ohio Company for importing English cattle, and \$9,200 was subscribed in \$100 shares. Agents sent abroad brought back 19 Shorthorns and each year the herd was increased, until in 1836 it was sold at public auction, the first thoroughbred cattle sale ever held in America. When the company affairs were wound up a dividend of \$280 per share, totaling \$25,760, was declared.²² Very great benefit had resulted from this introduction of English Durham stock and crossing it with the common stock. Some of the full-blood bulls and cows were sold into other states and the whole stock of cattle in the West was thus improved.

With regard to the Herefords, Clay's example was followed by Admiral Coffin, who sent a bull and a heifer of Hereford stock to the Massachusetts Society for Promoting Agriculture. In 1840 a large importation was made by New Yorkers, but Herefords failed to catch the popular fancy as had the Shorthorns.²³

It was in the middle of the nineteenth century before many Devons were imported. Robert Patterson of Baltimore

²² U. S. Agricultural Report, 1851, p. 98.

²³ Thompson, Chap. IX.

became an extensive breeder of Devons, and the Massachusetts Society for Promoting Agriculture also imported a herd. In New England, Devons, through cross-breeding, supplied the best beef of the Boston market, the consumers of the best beef produced in America. In the fifties Ayrshires and Jerseys were imported when dairying became an extensive activity, and a little later the Kerries were also imported, but these were not so important as beef animals. The earliest Holstein herd came after 1860.

Beef and Dairy Cattle in 1860

From this survey it is clear that by the end of the Civil War the beef and dairy herds were distributed where one would expect to find them—the beef cattle, chiefly Shorthorns, in the Ohio region and westward, the dairy cattle in the Atlantic states.

At this period the breeding of beef cattle was chiefly confined to well-to-do gentlemen farmers, or to a few professional stock raisers who were able to command considerable capital, as in Ohio. Much good resulted from their efforts, though there was too much breeding, and due to the "battle of the breeds" and lack of foresight the opportunity was lost to develop a distinctly American breed.²⁴

Growth of the Beef Belt

Professor James Westfall Thompson has pointed out in his admirable work on the history of stock raising that during the period, 1830-1860, it became evident that there was a definite belt or zone of territory corresponding broadly to the 40th parallel of latitude which affords the best facilities for cattle feeding.

If one starts at Portland, Maine, and comes south by way of Boston, Hartford, and Harrisburg, he finds a gradual improvement, while the quality culminates to perfection in the vicinity

²⁴ See Year Book of Department of Agriculture, 1899, article by John Clay, veteran Chicago stockman, "The Work of the Breeder in Improving Livestock."

of Philadelphia. From Philadelphia westward, whether coming by way of Wheeling, Columbus, Indianapolis, Springfield and so across the Mississippi or by way of the Mohawk Valley and Lake Erie, one finds the same perfection of quality.

In this belt, experiments proved that cattle pastured there fattened in less time and mixed their lean and their fat, or marbled their flesh, much more fully and evenly than cattle raised elsewhere. North of this zone the intense cold caused unprofitable consumption of provender in order to preserve the required amount of animal heat, and the beef was of poor quality, dark in color, and with little or no admixture of fat and lean. Montreal beef is an example. South of this zone, beef, it was found, became stringy and the fat became tallow, not being interlarded with the flesh, but in a solid layer composed of fat only. All southern beef shows this quality.

This zone Professor Thompson labels the "American Beef Belt." At its widest part this belt lies between the 36th and 43rd parallels and extends west to the 100th meridian, i.e., to the edge of the great plains in central Kansas and Nebraska.

It was, however, not until 1840, or thereabouts, that this zone and its superiority in the production of beef animals was well recognized. A writer much given to praise acknowledged that prior to 1840 the "neat cattle" of the West were inferior in size to those of the older states.²⁵ This was due, he claimed, entirely to bad management. The cattle of this region were not penned up in pasture fields, or housed, but suffered to run at large "on the commons." In Ohio the cattle were simply fed twice a day, in open lots of 8, or 10, or more acres, each lot provided with unhusked corn for fodder, and following the cattle came hogs to clean up.²⁶ Hence all the calves had to be preserved without regard to quality "in order to entice the cows home at evening." Food was scanty enough in the autumn, yet not infrequently a herd of, possibly, a hundred cattle would be left all winter to pick a precarious existence in

²⁵ Peck, *Guide* (1836), p. 282. *Guide*, 1837, p. 287.

²⁶ Census (1860), p. cxxix, *Cattle and Cattle Trade of the West*.

the open. Such treatment could not fail to produce stunted cattle.

Occupations in Cattle Industry

With the great subsequent development of the stock raising industry within the Beef Belt it was natural there should arise a differentiation of activities in the business. Hence, the cattle industry in those early days comprised at least five different occupations. First, there was the raiser of cattle or "stock raiser" who sold the animals at the end of one, two, or three years to the "grazer." Cattle raisers, during the forties and fifties, were found chiefly on the great prairies of Illinois, Missouri, and Iowa, and they carried on the business on such an extensive scale that it was said that a farmer called himself poor if he had not a hundred head of cattle about him.²⁷

The grazers, during the earlier decades of the industry, were very largely the owners or renters of the great pasture lands in such counties as Madison, Fayette, and Union, in Ohio. After the Civil War the raising of cattle began to be carried on more extensively in the states farther west, and in time the business of grazing came to be one in which the farmers of a state like Illinois, for example, engaged almost exclusively. After the cattle had been allowed to graze all summer they were taken over in the fall by the cattle feeder, or "stock feeder," the raiser of corn, who fattened the cattle for market in the Atlantic cities. Cattle were also sometimes fattened at the distilleries on the waste mash.²⁸ As the raising of cattle came to be confined more to the prairies farther west, the great corn crops of Illinois were utilized to a greater extent in the work of feeding the cattle for their final fattening, just before marketing them. The cattle were purchased in the fall from the states west of the Mississippi and were brought to Illinois to consume the crops of corn during the winter. Likewise, in

²⁷ Peck, *Guide* (1836), p. 282.

²⁸ *Alton Courier*, Mar. 29, 1853.

the spring cattle were imported to consume the grass on the pasture lands.

Another functionary was the drover, who was especially prominent after the feeder had completed his work. He took the large herds from one part of the country to another, and ultimately conducted them across the mountains to their final market.. After the advent of the railroads the drovers' business languished to a very great extent. Last of all of the occupations in the industry was the banker who supplied the funds.²⁹

Cattle Distribution by States

The discussion of the breeds of horned cattle and methods of marketing leads naturally to a survey of the numbers at the end of this period. The total number of neat cattle for this period is thus noted:

In 1840.....	14,971,586
In 1850.....	18,378,857
In 1860.....	25,640,337

Taking the total number and comparing it with the total population for these years we find that in 1840 for every 100 people there were 87 head of cattle, in 1850 there were 79, and in 1860 there were 81 head of cattle. The ratio of cattle to population therefore was 80 per cent.

Coming to the subject of distribution of cattle, Dr. Silas Loomis, who made a special study for the federal government in 1863, gives some interesting data. He divided the states into three classes, viz., minimum, medium, and maximum. The first class included the states having less than the normal requirements of 80 per cent; the medium class those states having between 80 and 100 per cent and the maximum those states which had over 100 per cent. We shall consider the distribution at the beginning of each decade.

²⁹ *Prairie Farmer* (Oct., 1849), Vol. IX, p. 305.

Cattle Distribution in 1840

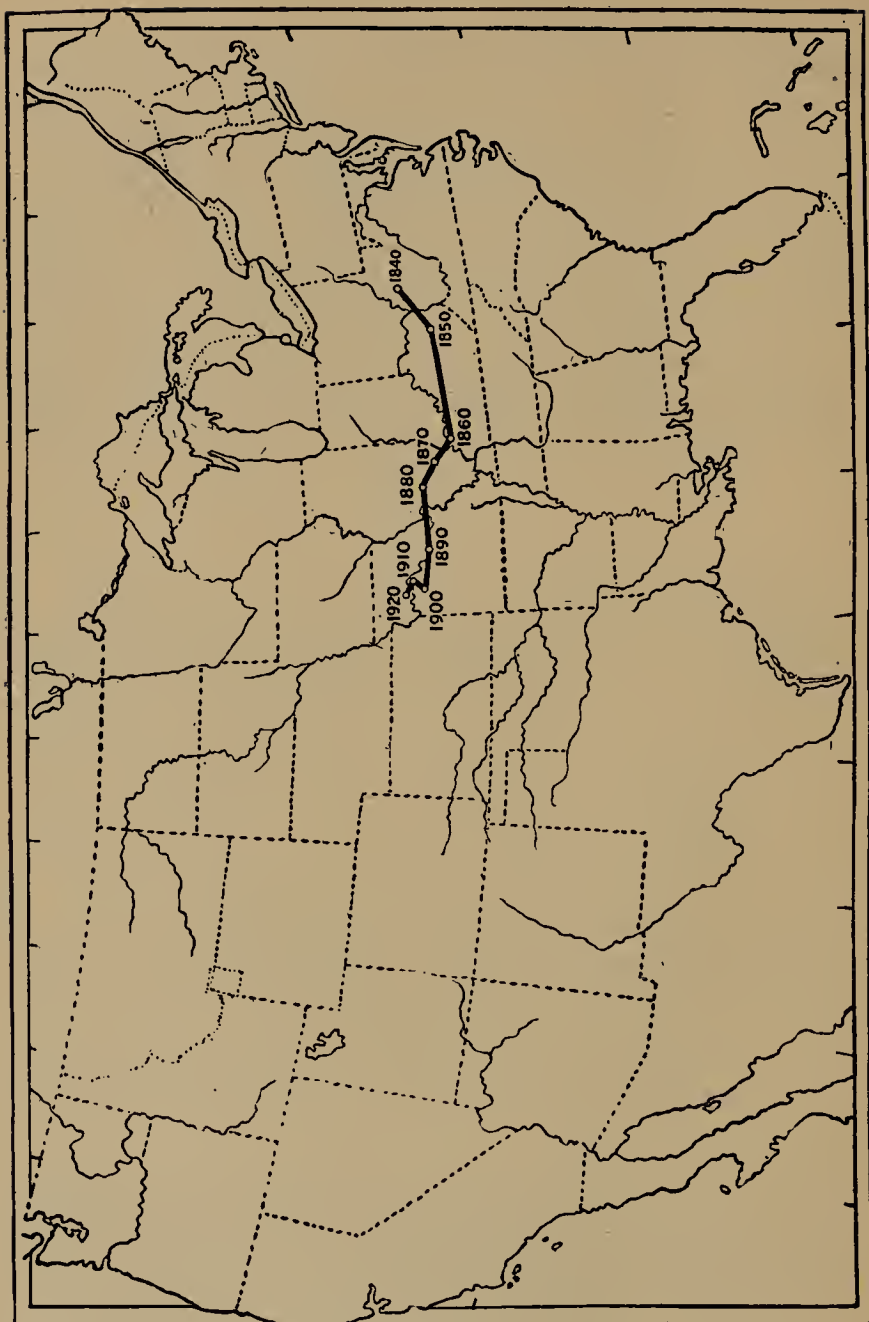
The general distribution of cattle in 1840 is plainly evident from this study. In the East cattle were by far too few in proportion to the population, except in Vermont and New Hampshire. In the Ohio Valley conditions were better balanced. In the Far West of that time the number of cattle was much in excess of the needs of the people. The West had nearly three times as many cattle as the East in proportion to the number of inhabitants. The greatest deficiency was in Massachusetts and Rhode Island. The greatest excess was in Florida and in Arkansas, where the ratio was six times as great.

Cattle Sources in 1850

By 1850 the western limit of the minimum class of states had moved westward from the Potomac and Monongahela rivers—its position in 1840. The western edge of the minimum group had advanced at least 500 miles, and now commenced at the southern boundary of North Carolina and followed the southern boundary of Tennessee to the Mississippi. North of the Ohio River, Illinois was the only state of primary rank as a cattle raising state east of the Mississippi.

The medium class in 1850 was represented only by Alabama in the South and New Hampshire in the North. At the same time Massachusetts dropped from a low 35 per cent to 24 per cent, and Rhode Island from a low 38 per cent to 26 per cent.

The maximum class in 1850 occupied the same position as it did in 1840, with the exception of Alabama; but those states lying east of the Mississippi declined from an average of 145 per cent in 1840 to an average of 115 per cent in 1850. In the same interval also the states west of the Mississippi made remarkable increases of ratio, from an average of 131 per cent in 1840 to 159 per cent in 1850. As might be expected, Texas heads the list with 438 per cent.



Courtesy Armour's Livestock Bureau

Figure 2. (b) Map Showing Change in Center of Cattle Production, 1840-1920

Cattle Distribution in 1860

From the data afforded by the years 1840 and 1850; and the deductions derived from them, the student of statistics might pretty accurately forecast what the distribution of cattle in the United States would be in 1860, anticipating the census of that year.

In 1860 the minimum class of states remained nearly the same as in 1850. South Carolina by this time had fallen into a minimum condition, while Indiana had partially recovered and climbed into the medium class.

The medium class contained many of the states which in 1850 were in the maximum class. In the South were Georgia, Alabama, and Mississippi; in the West, Indiana, Illinois, Missouri, and Kansas; in the East, New Hampshire—each containing between 80 and 100 per cent. It is evident that in the ten years between 1850 and 1860 cotton steadily drove out cattle in the southern states. So far as the North is concerned the notable facts are the rise of Indiana from its former minimum status, and the drop of Illinois and Missouri from first to second place.

In 1860 all the maximum group of states were west of the Mississippi, with the exception of Vermont and Florida at the northeast and southeast corners of the Union. These states were Kansas, Nebraska, Arkansas, Texas, California, Oregon, and Washington. The greatest diminution of this decade was in South Carolina, which dropped 44 per cent. Louisiana lost 35 per cent and Mississippi 30 per cent. On the other hand, the greatest increase was in Texas, California, Indiana, Iowa, and Minnesota.

Cattle Sources North and South

From these figures and a comparison of them it is evident that when the Civil War broke out the chief, almost the only, cattle source of the North was in Indiana and Illinois, and in the new states in the middle border; while the South had two

sources in Florida and Texas, both of which states contained huge surpluses of cattle. The states on the Pacific Coast, of course, were too far removed to be of any value to the North, no matter how great their loyalty to the Union was. The same statement probably would be true of Texas in relation to the southern Confederacy. Considering the lack of railroads in that part of the South when the war came, and in addition the two other facts that federal war vessels blockaded the Gulf Coast and federal monitors patrolled the line of the Mississippi River, it is doubtful if Texas was any material source of cattle supply for the people of the South during the great conflict.

CHAPTER III

CENTRALIZED CASH LIVESTOCK MARKETS

Distribution and Marketing

Discussion of the distribution and movement of cattle brings up the whole subject of the marketing of livestock and the development of the great livestock markets. As the essentials of the modern institution of a cash market grew up in the period before the Civil War, it is well to consider the problem at this point.

The methods of the early days in Ohio and Illinois were simply those of Pennsylvania, Virginia, and New England under similar conditions in an earlier period. The same terms were used in the West as in the East, e.g., the distinction between "stock feeders" and "stock raisers" was established in Lancaster County, Pennsylvania, shortly after the Revolution.

The earliest cattle markets were centered in Boston, New York, and Philadelphia. The Boston one became located at Brighton, now a part of the metropolitan area of Greater Boston. Just when the famous Brighton Cattle Market was started is unknown. The originator seems to have been Jonathan Winship, who died at an advanced age in 1820. The following account of its development is of interest ¹ and shows the very close connection between the livestock market and the slaughtering industry even in that early day.

Brighton Cattle Market

Being a contractor with the English government for beef for the army, and owning a large tract of land where Brighton

¹ "Brighton Cattle Market," *Country Gentleman* (1860), Vol. XVI, p. 100.

now stands, Mr. Winship established a large slaughter house there, and producers of beef cattle soon began to find their way to this place to effect a sale. Other butchers came here to compete with him in making purchases, and in a short time the business became centered here, Mr. Winship having wisely encouraged and fostered it. This is believed to have occurred at the time of the old French War (1756) or very soon after. From that time this was the cattle market of New England, and soon after the butchering business also began to center there.

Following the Revolution the business increased rapidly for twenty or thirty years, at the end of which time there were often as many as 5,000 beef cattle sold and slaughtered in a week. Most of the beef was barreled and salted, but the building of railroads had nearly destroyed that branch of the business. The increase of population caused a corresponding increase in the demand for fresh meats, but the aggregate number of animals slaughtered was much less than when beef was barreled there.

Old-Fashioned Cattle Selling

Brighton Market was the model for many others in the East and later in the West. It continued its importance until the rise of the dressed beef industry in the seventies and eighties. As an example of the old-fashioned market institution, which was the forerunner of the great modern centralized livestock market, a writer in the *Country Gentleman* in 1860 thus described it:

Thursday of every week, which by common consent and custom is the market day, changes the generally quiet village of Brighton into a scene of bustle and excitement. At early morning the cattle, sheep, etc., are hurried in and soon the morning train from Boston, omnibuses, carriage and other "vehicular mediums" bring in a throng of drovers, some from as far away as Maine, buyers, speculators and spectators; so that, by 10 o'clock, there are generally gathered as many as two or three

hundred vehicles in the area fronting the Cattle Fair Hotel. The proprietors thereof throng the spacious bar-room for the purpose of warming themselves in winter, and in summer "cooling off"—the process for effecting both results being precisely the same. The portico of the hotel is occupied by hawkers and peddlers, who sell clothing, jewelry, soap, watches, knives, razors, etc. (to say nothing of their customers), at astonishingly low rates. An "English hunting lever eighteen carats fine," is frequently sold for five or six dollars, and, of course, is a genuine article. In the region round about "Mammoth Steers," "Living Skeletons," "Snakes," etc., are on exhibition at reasonable prices.

All morning the butchers and the drovers are busily engaged in their traffic. The fattest and best of the cattle in the pens find a ready sale, and long before all the drovers are in, select lots begin to be driven from the grounds. Men and boys hurry up and down the lanes and through the pens, each armed with a stick which is a sort of a shillalah, shouting to the half-crazed cattle, and with screams and blows directing them where they should go. Occasionally a drove of cows and calves come along, the latter muzzled, and the former looking and bellowing in chorus to the shouts of their drivers. Farmers from the neighboring towns are selecting "stores" from the large number of that class in the pens, and dairymen carefully examining the "milky-mothers" that are so anxious, seeking their young from the midst of their companions. Working oxen are driven in by the farmers from the vicinity, who sell, only after much banter, to buy again when prices are low. In the midst of these, dogs and goats and mules are offered for sale, and near by, are the hog pens, containing, at this season, only stores, which are sold singly and in pairs to small farmers, mechanics and others who think they can afford to "keep a pig."

The forenoon is busy enough. At high noon the huge bell of the hotel announces dinner, and for a brief period there is a breathing spell for man and beast. After dinner, business again resumes its way. The voice of the hawker becomes hoarse, but it is by no means silenced. Drovers who have not made many sales get nervous, and pens are cleared out without much regard to profit on the part of the seller. The butchers begin to turn their faces homewards, and the drovers, generally with well-filled wallets, start for Boston. A few, not liking the prices, and hoping for "better times," make arrangements to turn out their cattle to pasture, and hold over to another week. By five o'clock

the business of the day is over, and Brighton subsides once more into a quiet, matter-of-fact Massachusetts village, till another Thursday brings round another market day.

Western Cattle and Eastern Markets

With the continued growth of population, urban and rural, in the seaboard states there came an increased demand for beef and pork. This demand was met by the surplus from the new cattle and hog raising region of the Ohio Valley. Indeed, an English traveler who visited Ohio in 1818 described the prairies as "filled with herds of cattle for the Philadelphia and Baltimore markets."² These cattle reached the eastern markets by being driven there. The history of the rise and decline of Ohio droving is a short but interesting chapter in the history of the New West. At least as early as 1805 Kentucky and Ohio cattle raisers began to drive cattle to Philadelphia and Baltimore.

This was the economic situation. Ohio even when almost a wilderness grew very large crops of Indian corn with but little labor. However, transportation was bad and markets too far away for profit. Since the corn itself could not be transported, it occurred to Felix and George Renick, a couple of recent emigrants from Henry County, Virginia, that the corn could be fed to cattle and the cattle could be driven east, yielding a profit both in corn and cattle. The Napoleonic Wars in Europe kept up the price of corn, so that the most profitable days of Ohio droving were between 1805 and 1815. It was in 1805 that George Renick drove the first lot of fat steers from the Scioto Valley in Ohio over the Allegheny Mountains to a seaboard market at Baltimore.³ In this way

² Quoted in Thompson, Chap. IX.

³ U. S. Agricultural Report, 1849, p. 298.

It is interesting to note that the first cattle ever driven from Illinois to eastern markets were taken to Philadelphia by two Renicks of another generation, Seymour and Felix Renick, in 1838. The cattle not only held their flesh but were in better condition when they arrived than when they started. The Renicks were advised in Philadelphia not to make known the fact that they had driven the cattle from Illinois, but they insisted on putting them on the market on their merits and with satisfactory results. The prejudice which had to be overcome reminds one of the later ignorant prejudice against western dressed beef. (*The National Livestock Journal*, Vol. VI, No. 8.)

was started a competition in meat production between eastern and western farmers, which increased to such an extent that it practically drove the eastern farmer out, not so much because conditions favored the West as because of the relatively inferior equipment of the eastern farmer.⁴ This drove of the Renicks sold at a net profit of \$31.77 per head.⁵ At first the cattle were taken to plantations on the Potomac to fatten for the Baltimore and Philadelphia markets, much as in later times the cattle of the great plains were brought to the feeding grounds in the Corn Belt of Kansas, Nebraska, and Iowa, but about 1830 the feeding grounds shifted into Ohio.

Cattle Droving to New York

In 1817 the first western cattle, 200 in number, were taken to New York from Chillicothe by a drover named Drenning. DeVoe states that according to the New York press "they appear just as fresh as if taken off one of our Long Island farms. When it is recollected that they have been driven nearly one thousand miles, this fact will be considered a very remarkable one."⁶ From this time on droving to New York was just as common as to Philadelphia.

Two grades of cattle were driven east. First, the three-year-old steers, called "stock cattle," were driven to eastern Pennsylvania where the farmers bought them and fattened them for market. Second, fat four-year-old bullocks were driven more slowly and sold directly to the butchers.

Livestock Routes from the West

From Ohio there were three principal routes: first, the northern road by way of Erie, Pennsylvania, and Dunkirk, New York, and thence down the Mohawk until after the construction of the Erie Canal in 1825. And right up to the

⁴ *The National Provisioner* (Feb. 24, 1906), Vol. XXXIV, No. 8.

⁵ Cattle then sold at \$25 per head for cattle measuring a fixed number of feet around the belly, and \$1 was added or subtracted for every inch over or under this measurement. (Melish, *Travels*, p. 481.)

⁶ DeVoe, *The Market Book*, p. 411.

coming of railroads live cattle were usually driven, meat, lard, pork products, etc., being shipped by boat. Second, the road crossing the Ohio River by ferry at Wellsville, and leading to Philadelphia via Pittsburgh. When the Pennsylvania Railroad was completed, Pittsburgh became a stockyard center to which the cattle were shipped east by rail. Third, the more southern road following the old Zane's Trail from Zanesville to Wheeling and thence either through Bedford, Pennsylvania, to Philadelphia, or through Cumberland, Maryland, to Baltimore. These three routes are practically the same as those of the New York Central, the Pennsylvania, and the Baltimore and Ohio railroads today.

The following description, by Professor Thompson, of the droving and its setting brings the picture vividly to mind :

Along these roads were "drove stands," inns, or rather big farmhouses where the drovers lodged, surrounded by cattle pens and corn cribs. The crew of drovers comprised a boss, often the owner of a herd, a man to ride along each side, and another to lead. The last led an ox as a sort of bell-wether for the herd. The Centreville whip was a famous weapon for these drovers. It was originally manufactured by a harness-maker there and attained great fame. These whips had linen or silk "crackers" and the report of them was like a rifle shot. The hired drovers received \$15 per month, and had to walk home. It was the rule to allow thirty-three miles as a day's walk. Fast walkers made forty. In this way, in five days, a man might make an extra half dollar plus another fifty cents which he was allowed for board and lodging.

Droving a Seasonal Business

It should be noted that this droving was seasonal. The great bulk of cattle arrived at the eastern markets between the middle of April and the first of August. None came in the spring and fall from the West. There was not the continuous flow that there is today.

The cattle trade of the Scioto Valley increased greatly until 1850, in spite of the opening of the New York and Ohio canals,

which gave the Ohio farmer access to a better and more reliable market enabling him to sell for cash, but at better prices. The completion of the great through railroads added still further to the farmer's resources. They made it possible for him to diversify his farming, and they aided in bringing the corn feeding of cattle to the highest point. From 1850 to the Civil War the whole number of cattle corn-fattened may not have declined much, owing to the increase in home consumption and the extensive barreling. However, the number sent to eastern markets certainly fell off.

Middle West Cattle Sales

As a result of the separation of the functions of stock raiser and stock feeder there developed in the West a better business organization to govern the cattle industry. The most important institution that grew up was the cattle sale, and the most typical of these was the one in Madison County, Ohio. This monthly or quarterly sale, or "market fair," had long been established. On the sale days, the grazer, feeder, and seller bought their fattened animals, and the butcher came to make his purchases both at auction and on private terms. It was a valuable system.

The same custom on a more picturesque scale was seen in Kentucky at Paris in Bourbon County. A monthly court on the first Monday of the month brought the planters and stockmen together at the county seat, whence came the idea of having at the same time a general sale and purchase of livestock. Northern men met southern buyers. In an article entitled "Court Day in Bourbon" this middle west forerunner of our great centralized markets is described:⁷

As we said, other counties have their court-day fairs, but Bourbon claims precedence over them all; and tell a Bourbon man that they had a good attendance at Lexington, Versailles, Frankfort, or Georgetown, on such a day, and he will contemptuously throw

⁷ *Country Gentleman* (1856), Vol. VIII,

it aside with a "possibly—but it is not a circumstance to Bourbon!" On this day numerous drovers of mules, asses, and the horses of the riders, a little after the courthouse clock had struck eight, began to thread their way into town. As they were driven in, the several squads of animals were gathered into little paddocks which are enclosed at the foot of the hill just below the courthouse, preparatory to being brought on to the "square" for exhibition and sale. Now, this square is a little huddled-up place, fronting on the main street, containing two or three acres, in the center of which is the courthouse, with its wings of county offices, and around it some posts and a railing to which every rider as he comes into town on horseback "hangs" his horse—pretty much everybody coming in on horseback, by singles, couples, and squadrons, as they may or may not fall in with each other when issuing through the gates which lead out from their several farms and enclosures; for few people out of the towns live on the road, and a great majority of them pass through one or more farms belonging to others to reach the highway. By half-past nine o'clock the streets around the square are pretty well filled with people; a few pedlar's wagons containing harnesses, saddles, bridles, halters, etc., are stopped in front; a dozen or more auctioneers are in attendance, on horseback, ready for their work; and then the cattle, mules, jacks, jennys, horses, sheep and swine begin to gather in from the highways, or the paddocks below.

Noisy Cattle Auctioneering

And now commences such a hubbub, and shouting, and auctioneering, but each in its own well known department, as is seldom or never known out of this aforesaid Paris. The buyers from the neighborhood, the adjoining counties, and the adjacent and distant States are all there looking for what they want, and finding it, intent on making bargains. The stock-sellers, knowing quite as well what they are about, put their droves into the hands of the auctioneers, and in a few minutes a dozen tongues are laboring with might and main in crying their sales, and "throwing away bargains"—each one in the midst of the beasts, which are awaiting the fall of his decisive hammer. One would think that in this confusion worse confounded of a dozen droves of mules, half as many of cattle, and scores of single horses all mingled in the multitudinous mass, no one would know his own. But the men in charge are up to it, keeping their beasts in compact knots, and rarely missing one from his fold, each of which

seems to know its companions as instinctively as a brood of chickens do their mother. For two or three hours lot after lot is struck off, and as the sales are made, driven back into the paddocks till the bargains are settled, and the exchanges duly made.

By one o'clock the sales are chiefly over. The tavern dinner bell rings, and the assembled crowd adjourn to the tables. The inner man refreshed, the remaining unsettled business is closed up, the purchasers take possession of their new stocks, and by three o'clock in the afternoon hundreds of horsemen are seen mounted and wending their way out of town singly or in squads as they came in, while a few, perhaps, not selling their stocks to their mind, are seen with their men driving them back to their homes. In another hour the town of Paris is as quiet as if hardly a stranger had appeared in its streets, and transactions to hundreds of thousands of dollars in amount have all been settled and secured.

A gentleman conversant with the business of court-days, told us that he had frequently known the bonafide transactions of the day to amount to more than \$250,000. Stock is usually sold at two to four months time, on bankable notes, payable either at home or in the eastern cities. Cattle buyers from New York, Pennsylvania, and New Jersey are frequently there, mule buyers from the same States, Maryland, Virginia, the Carolinas, and Louisiana, while much stock goes back into the same neighborhood from which it is driven to different owners, who still feed and further improve it for a future court-day sale.

This way of doing business we like. It brings every farmer and stock-dealer right up to the mark. The true value of stock is thus well known, men know what they can give and pay it. Others know what they can afford to take, and sell. The business is done up, and no whining or jockeying about it. Yet men are not obliged to sell, if prices rule too low. Sometimes on a dull day, sales are withdrawn and private negotiations effected: but when parties are in earnest, the sales are all made under the hammer; and a prompt way it is. If our New York farmers could have their stock sales at central points, we believe it would be greatly to their advantage; but as they have smaller farms than in Kentucky, and deal in a smaller way, it may be sometime before they adopt it. Yet they must ultimately come to it, as we get our farming systematized, and the proper division of agricultural labors arranged. It will be long before our farmers can individually cope with those of central Kentucky

in the number and value of their herds, but there is no good reason why they should not adopt a custom so useful in the sales and purchases of their marketable stock.

Decline of Cattle Fairs

These fairs, which were very important, declined in the course of time, partly from want of system and energy on the part of the originators, partly because of the growth of population in certain centers, and finally because of the development of transportation, making necessary modern large-scale livestock markets.

With the passing of time, Cincinnati, Buffalo, and Albany rather than Philadelphia were the points where the greater part of the surplus supply of livestock from Illinois and other middle west states was collected.⁸ Indeed, by 1860, beef cattle from Iowa were often brought up and driven over to Illinois for fattening and then sent east. The records show that Illinois got the credit for these cattle, a fact complained of by the Iowa raisers.⁹

In cities like Cincinnati, for example, which were then the great collecting points for the business of droving, and in a great many small river and county towns, there were often slaughterers who bought the beeves offered, and who either salted the flesh in casks or barrels or sold it to supply the demand for immediate local consumption. Most of the dealers, however, bought the offerings and drove them to markets nearer the Atlantic seaboard. A very small proportion of the cattle raised in Illinois were killed and packed there.

Less Hog than Cattle Droving

On the other hand, most of the hogs raised in the state were killed at the nearest packing point. The reason for this is clear. Hogs suffered much greater shrinkage in weight and deterioration in the quality of their meat as the result of an

⁸ Annual Report, U. S. Bureau of Animal Industry, 1885, p. 376.

⁹ *Country Gentleman* (1862), Vol. XX, p. 356.

overland journey, than did cattle or sheep. Moreover, pork when cured and pickled was a much more marketable product than either beef or mutton, which had been similarly prepared. For this reason, during this entire period the packing of pork was so vastly more important than the packing of beef or mutton, that there were many places where the packing of pork was the only packing carried on. At Cincinnati in 1826, it was noted that "among exports, beef formed a smaller portion than would at first be supposed." The prediction that "the greater facility for raising cattle and the high price of beef in other places were such that it might easily be rendered a large and profitable article of export," was never fulfilled; cattle were raised in increasingly large numbers, but almost the entire crop was driven across the mountains each year to the great seaport cities.

The farther west we go from Cincinnati, however, the larger was the proportion of beeves killed and packed in the same region where they were raised. A much larger amount of beef was packed at Alton, Illinois, in proportion to the amount of pork packed there, than was packed at the great Ohio "Porkopolis." And in Missouri, which was so much farther from the seaport that the driving of cattle overland to the market did not appear feasible, "vast herds were raised on the Western border of the state and thousands were there slaughtered, and the meat salted and exported by way of New Orleans to the eastern states or to the West Indies."¹⁰

Beef Packing Important

It must not be thought, therefore, that cattle assumed no importance in the packing industry. Such an idea is very far from the truth. With each succeeding year the business of beef packing in the West increased, and in spite of an attempt to concentrate this business at Cleveland, Chicago soon became recognized as the center for this part of the packing industry,

¹⁰ Baird, *View of the Valley of the Mississippi*, p. 207.

East and West in canals and turnpikes facilitating movement of livestock and meat products, but they now had to be supplanted by steam power. Hence began the building of railways to connect the East and West as cheaply and readily as West and South.

By 1842 the Boston and Albany Railroad connected near Albany with the Erie Canal and another road had been built to Buffalo. The Philadelphia, Wilmington and Baltimore, the Philadelphia and Reading, and the Baltimore and Ohio to Cumberland were all in working order, and by 1851 the Erie Railroad was opened from the Hudson to Lake Erie.¹²

In the fifties the trunk lines were rapidly completed. The construction of the Lake Shore and New York Central Railroads between northern Ohio and the seaboard at New York and Boston, the building of the Pennsylvania Railroad between Pittsburgh and Philadelphia, and the Baltimore and Chesapeake Bay, each of them identical with one of the three pioneer routes to the West, gave the western farmers far greater accessibility to the markets of the East than before.¹³

The importance to livestock development of this building of railroads is summarized by Professor Johnson as follows:

The transportation of livestock from the grain-belt to the eastern states was taken over almost entirely by the railroads. Neither the Erie Canal nor the Pennsylvania Canal had carried many hogs and cattle, though large quantities of meat, lard and other animal products had been sent to the eastern cities over both these routes. After the rise of the pork-packing industry at Cincinnati and other cities of the Central States, but few live swine were sent to eastern markets. However, the trade in cattle continued to flourish. Large numbers of cattle were driven from Ohio (usually by way of Buffalo and Albany) to New York, where more were slaughtered than in any other city. Illinois, too, raised many cattle, but the distance was too great to permit the driving of fat stock to the eastern coast, and consequently the

¹² Poor's Manual of the Railroads of the U. S. for 1881.

¹³ The future success of the trunk lines from the Lakes and Ohio to the Atlantic was due to the extension of these lines by other railroads into the interior of the United States. (Poor's Manual, 1881.)

Illinois farmers sent their cattle to Ohio, where they were fattened for the New York market. The cattle trade of Ohio thus had a period of great prosperity up to 1850. . . .

The advent of the railroad put an end to the practice of driving fat cattle to distant markets. Moreover, the railroads brought Illinois farmers nearer to the Atlantic coast than the cornfields on the Scioto had been during the preceding years, and it was no longer impossible for the Illinois farmers to feed their own stock and send it directly to New York and Philadelphia. Ohio was soon surpassed in the production and sale of corn-fed cattle by the corn-raising states farther west. The transportation of cattle was an important source of profit to the western railroads and to the trunk lines, and large numbers of hogs and sheep were shipped from the Central to the Eastern States, constituting almost a totally new element in the commerce between the two sections. In 1859 livestock furnished a larger amount of the through eastward traffic of the Pennsylvania Railroad than any other single commodity, and the other trunk lines and the railways radiating from Chicago, Toledo and Cincinnati transported each year an increasing number of animals destined for the slaughtering-pens of the East.¹⁴

Cattle Marketing Changes

It was in cities like Cincinnati, Buffalo, Cleveland, St. Louis, and Chicago that the greater number of cattle came to be marketed, but in the early days there was no necessity for the combination of conveniences that today are known as stock-yards. As showing the development that took place later on a smaller scale elsewhere we can trace the history in Chicago.¹⁵

At first the small droves of cattle or hogs which were driven in from the country were readily disposed of to residents of old Chicago. They were bought as soon as seen and seldom was there any reasonable cause why the seller should keep them on his hands for more than an hour after his arrival. As year by year went by, however, the trade increased and there came a demand for some kind of accommodation for

¹⁴ Johnson, *Commerce of the U. S.*, Vol. I, pp. 239-240.

¹⁵ This account of the growth of the Chicago Union Stock Yards is based largely on an article in the *National Livestock Journal* (Sept., 1870), Vol. I, No. 1, which is quoted from Griffith's *Annual Livestock Review*.

livestock while it remained unsold. This demand resulted in the birth of the present elaborate system of stockyards.

Even at first there was an occasional necessity felt by the seller for some place or other in which to keep livestock for a few hours after arrival in the city, for the reason that sometimes a drove would reach the city too late in the day to meet a sale before the next morning. Or perhaps the arrival of two or three lots at about the same time would induce some competition in the trade, which would necessarily result in more or less delay.

Early Stockyards

Therefore, yard facilities for the convenience of the drovers were indispensable adjuncts of the slaughter houses, even in the earliest days. Proprietors of these establishments rarely failed to mention in their advertisements that, annexed to the slaughter houses were "large, dry, and convenient pens and lots, where droves of cattle and hogs could be kept free of charge until sold or disposed of."¹⁶ One proprietor states that his enclosures are situated in an especially advantageous location "on high, sloping, rocky ground, where stock can be kept neat and clean"; another emphasizes the security of his pens, and mentions that "a stream of spring water passes through them." These yards were in almost every case owned by the proprietor of the adjacent slaughter house, who used them merely as an inducement to the farmers and drovers to bring their stock to his establishment. So far as we know, this may be considered as the ordinary condition outside of Chicago.

At a comparatively early day in Chicago, private yards existed, entirely superseding the smaller yards which belonged to each slaughter house. The first of these yards, located at the junction of Madison Street with Ashland Avenue, and bearing the significant name of "Bull's Head Market," was

¹⁶ *Alton Telegraph*, Oct. 26, 1839.

opened in 1848.¹⁷ These enclosures had no railway connections, however, and the driving of stock to and from them soon became a nuisance. With the growth of the livestock trade of the city upon the completion of the radiating lines of the various railroads, they proved to be too small. Although but at best a make-shift, they were the only yards in the city for some years. In 1856, John B. Sherman leased the Myrick property, a plot of thirty acres on the lake shore north of 31st Street, and laid out yards which were capable of accommodating 5,000 cattle and 30,000 hogs. These yards, situated on the Michigan Central and Illinois Central railroads, and accessible to all the other yards by means of the Illinois Central crossing, became in a short time very popular and soon got the bulk of the trade, so the very name "Bull's Head" passed into oblivion, to be resurrected only when a description of the early livestock trade is being written.

In 1858 the Michigan Southern yards, which had been in existence since the building of that railroad in 1852, began to attain some prominence. These yards, though smaller than Sherman's, were also accessible by means of the Illinois Central crossing, and were said to be well fitted for their purpose. The Fort Wayne yards, the property of the Pittsburgh and Fort Wayne Railway, became the next candidates for public favor. Situated on the west corner of Steward Avenue and Mitchell Street and of about the same size as the Michigan Southern yards, the fact that most of the pens were two-storied rendered their capacity much greater than that of the yards owned by the rival road. They were opened to the public in 1859. The Cottage Grove yards, which had an acreage about half as great as that of the Sherman yards and a capacity of 2,000 cattle and 6,000 hogs, were opened in 1862, but after three years, during which they failed to prosper, they were discontinued.

In the fall of 1864, the Chicago, Burlington, and Quincy,

¹⁷ Andreas, *History of Chicago*, Vol. I, p. 563. Colbert, *Chicago*, p. 59.

and the Chicago and Northwestern railways, in conjunction with two or three individual investors, projected the Burlington yards, which were opened the following April, but they were too distant from the city to be accessible for shipping purposes and for that reason they lasted for only three months, when they were torn down and the material sold to the newly formed Union Stock Yards Company.

Civil War Forces Change

During the Civil War, there was an enormous increase in the production of cattle and hogs. The various stockyards of Chicago not only proved too small to accommodate the vast numbers of animals which poured in upon the city from nearly every train, but also, situated as they were at a distance, inaccessible and inconvenient for all parties in various parts of the city, on different and diverging streets, they proved a source of great dissatisfaction to dealers, shippers, and packers. They were in some instances two or three miles apart, and drovers were often obliged to drive their animals through the crowded streets of the city, from yard to yard, thereby undergoing the greatest inconvenience and, in many instances, actual loss, occasioned by the difficulty of driving and the rough pavements, which lacerated and tore the hoofs of the animals, producing pain and disease. The delay and expense of this method of traffic can be better estimated than told in figures.¹⁸ Moreover, trade in cattle and hogs was quite often active in one yard while at another it was extremely dull. The receipts at one yard would sometimes equal the combined receipts of all the others, thus rendering trade brisk at the latter and lifeless at the former. The shippers found that the best way to get the strongest competition or the highest prices was to have their stock where the buying strength was the strongest. Naturally the buyers were more numerous at the terminals of the lines bringing in the largest number of cars of livestock,

¹⁸ Transactions Illinois Agricultural Society (1865-1866), Vol. VI, p. 315*f*.

and as a necessary result the shippers patronizing the smaller lines were placed at a disadvantage, because they could not get buyers to look at their stock until they had looked over the receipts at the yards of the larger lines. In many cases they could not sell their stock except when there was an insufficient number at the larger stockyards to supply the demand.¹⁹ Commercial reporters found the greatest difficulty in making up a summary of the daily market, and consequently the figures upon which the shippers would naturally rely proved unworthy of confidence. Packers united with drovers and dealers in a demand for better accommodations.

Finally the railroad managers saw the inutility of the old system. The wear and tear on the rolling stock over the narrow and tortuous curves, and the great expense of switching, were eating a large hole in the profits. The magnitude of the business was such that even with most efficient management the railroads could not fairly cope with the situation.

Chicago Union Stock Yards

At its session of 1865, the Illinois legislature incorporated the Union Stock Yard and Transit Company, with a capital of \$1,000,000. The nine railroads whose lines converged in the yards took \$925,000 of this, the remainder being raised by private subscription. The Union Stock Yards were opened for business on Christmas Day, 1865. The entire area of the tract was 345 acres, of which only 100 were penned off at the time of opening, 45 more being occupied by the hotels and other buildings. The total cost had proved to be more than had been anticipated footing up at \$1,654,611. The land purchased was a swampy tract, which at that time lay just outside the city limits and required a great deal of ditching in order to fit it for its proposed use. Twenty-three hundred cattle and hog pens were built, having a capacity at the time of opening

¹⁹ Statement of Mr. Edward Morris, President of Morris and Company, before the Committee on Interstate and Foreign Commerce of the House of Representatives, 1919.

of 21,000 cattle, 75,000 hogs, 22,000 sheep, and 200 horses. The water for the yards was first obtained from the Chicago River, but this proved insufficient and two deep artesian wells were bored to the depth of over 1,000 feet each and these supplied an abundance of water.²⁰ The officers elected were largely railway officials or packers.²¹

When these yards were first opened each railroad handled the stock in and out of the yards, which brought about long delays to shippers because each railroad looked after only its own business, resulting in detentions to the business of its competitors. The only way to overcome this difficulty and avoid delays was for the stockyards to operate its own terminals where each shipper or each railroad would have equal rights with all other shippers entering the market.

First Livestock Commission Men

The most important factor in a cash livestock market, and as yet unmentioned, had just emerged at about this time, and must now be considered. This was the inauguration of the livestock commission merchant, who supplied a long-felt want and contributed more to the prosperity and progress of the market than any other single cause. In earlier days, as has been noted, the western buyer was compelled to be his own seller. First he was compelled to gather his stock from the prairie farms and thus fill the rôle of drover, and then he had to bring his cattle and hogs to the Chicago market and remain

²⁰ Transactions Illinois State Agricultural Society (1867-1868), Vol. VII, p. 404ff.

²¹ Officers, 1866

President.....	T. B. Blackstone
Secretary.....	F. H. Winston
Treasurer.....	Solomon Sturges' Sons
Superintendent	
Construction....	Col. R. M. Hough
Superintendent	
Yards.....	F. J. E. Bryant
Directors.....	James F. Joy
"	John F. Tracy
"	Ezekiel B. Phillips
"	John L. Hancock
"	C. M. Culbertson
"	J. N. McCullough
"	V. H. Turpin
"	R. M. Hough

Officers, 1867-1868

P. R. Chandler, Director, C.&A.R.R.
F. H. Winston.
Solomon Sturges' Sons.

John B. Sherman

James F. Joy, Pres., C.B.&Q.R.R.
J. M. Walker, Director, C.B.&Q.R.R.
E. B. Phillips, Pres., Mich.So.&No.Ind.R.R.
H. E. Sargent, Supt., M.C.R.R.
John M. Douglas, Pres., Ill.Cen.R.R.
J. N. McCullough, Supt., P.Ft.W.&Chi.Ry.
Geo. L. Dunlap, Supt., Chi.&N.W.R.R.
P. A. Hale, Supt., Chi.R.I.&Pac.R.R.

until he had a buyer. This necessitated the loss of a great deal of time in traveling.²² The main trouble in the pre-commission firm period grew out of the extended credit system. The drover bought of the farmer on credit, got his transportation on credit, and at the markets the cattle were sold to the wholesale butcher on credit and by him to the retailer on credit and then to the consumer and actually eaten up before they were paid for.

This state of things lasted until 1857 when the first bona fide livestock commission firm began business in the Chicago market. The stock interest was then demanding more and more attention, and when the opening of the eastern railroads so materially increased the demand for the products of western industry, the drover had all he could attend to in scouring the country and collecting the droves of stock. These he could then consign to men of experience in the Chicago yards for sale. The consignees so constituted obtained a market for the stock and received a commission. It was of course to their interest to get the highest prices possible and thus increase their own commissions. They had to be men of known integrity or they could not get and keep business. It was, therefore, to the drover's profit to employ them.

Advantages of Commission Men

The practical advantages of the existence of the commission man are apparent. He was always in the market and knew at all times what stock was worth. Before the establishment of this institution it was almost impossible to get full value for stock when the seller did not know what that value was. Another consideration was that, as soon as it was clear that Chicago was the great stock center of the West, very many men went into the business of shipping to the East and other markets. They bought in the city, and the drovers

²² "Transportation and Sale of Cattle," *New York Tribune*, quoted in the *Prairie Farmer* (Dec. 19, 1861), Vol. VIII, p. 407.

who at that time and for many years longer had no newspaper reports to rely on, were forced to sell at such prices as these dealers would give them. Hence arose the necessity of a dealer entrusting the sale to some man in Chicago, and in a short time nearly all stock was sold through commission men.

Even at this point the benefits of the system did not end. The sale of livestock at all the fairs and markets heretofore had been on a credit basis, resulting in loss. Now, the drover of the country could draw on the commission firms of the city for money as soon as his stock was delivered, and therefore he was able to use to his own advantage this capital, and that of the Chicago banks, in the prosecution of his business as a buyer from the western farmers. This system was found to work admirably, and to it may be attributed in an important degree the steady and rapid growth of this market in the sixties and until the present day. For with this institution of the livestock commission firm is completed the number of essential factors which exist in a centralized cash livestock market.

Factors in Centralized Cash Markets

These factors—a stockyards company, livestock commission firms, and meat packing companies—which are fundamental in the development of a great livestock market, were present at Chicago at the time of the Civil War. Their presence made it possible for the successful working of the causes which by the seventies gave Chicago supremacy as the world's greatest livestock market, and enabled the meat packing companies established there to put into operation inventions in refrigeration which introduced a new era in the meat industry of the world.

Causes of Chicago Supremacy in Livestock

The causes of Chicago's supremacy in livestock may be summarized as follows:

1. A comparatively sudden demand at a critical period in the history of the United States, namely, the Civil War, for the concentration of immense supplies of food and Chicago's quick response to such demand.
2. The rapid development of the nation's resources, transportation, and foreign trade, subsequent to the Civil War, Chicago becoming the greatest transportation center of the continent.
3. Chicago's unparalleled advantages as a point where the livestock and other food products of the United States could be concentrated, manufactured, and distributed with the greatest ease, economy, and dispatch.

Chicago World's Livestock Center

As to the first cause, the Civil War massed 2,000,000 men in the field and called for a food supply never before met nor even thought of in this country. The first city in the Union to grasp the situation and to be ready to meet it was Chicago. This city, in the heart of a section that had responded quickly and generously to the government's call for troops, lost no time in beginning the essential work of feeding the troops at the front. The inventive genius of Chicago devised many practical ways for converting cereals, meats, and other products into forms suitable for transportation and preservation. Industries were established that called upon the great agricultural section of the United States for raw products, and laid the foundation in Chicago of other great manufacturing enterprises.

The second fundamental cause is to be attributed to the remarkable development during the Civil War of the natural resources of the United States, the rapid building of railroads, the opening of factories in every direction, and the greatest activity in mining.

The unparalleled quantities of agricultural products called for transportation facilities on a scale unprecedented in any age or country. Railroads were extended from the Mississippi

Valley to the Pacific, and reached into almost every producing section, giving to the farmers an outlet for their surplus livestock, grain, and other products. More than this, the railroads were the most powerful factor in transforming barren plains into built-up villages, towns, and cities, in affording people of various sections the chance to mingle and become acquainted, establish business and family connections, and to receive quickly supplies of all kinds.

The astonishing increase of manufacturing, the rapid development of mining, and the growth of foreign commerce following the war, called for great quantities of food supplies. The chief demand came from Europe and the consequent export trade in meats and livestock originated almost entirely in Chicago.

As to the third cause, Chicago during and following the war was the point where the livestock and other food products of the United States could be concentrated, manufactured, and distributed with the greatest ease, security, and dispatch.

Chicago became the greatest railroad center of the world. Here was a point from which began and ended more lines of railways with more mileage than anywhere else. Chicago was located at the center of the population of the United States and had tributary to it the meat-producing West and the meat-consuming East. Hence, Chicago was the best market for both producers and consumers, the natural trading point where buyers and sellers of livestock met in the greatest numbers.

CHAPTER IV

THE PACKING INDUSTRY IN THE WEST UP TO 1870

Packing on the Farm

The preparation of the beef and pork slaughtered in the winter so that it would be preserved for summer use, by the process of either dry-curing or of pickling, constituted one of the chief duties of the housewife in every well-regulated American farmer's home up to the close of the first quarter of the nineteenth century.¹ The industry thus created by the necessity of procuring the proper food supply for the immediate family of the farmer and for the laborers whom he employed, gradually came to be the source of supply for the general public on the one hand, and on the other an important source of income to the farmer. Hams, bacon, and dried beef could always be exchanged at the country store for sugar and coffee, and the provisions thus acquired were, in turn, sent by the country dealer to supply the city markets. Meats were also pickled by means of a preparation of brine and saltpeter and shipped in barrels to more distant markets.

The industry of packing meats, which thus had its origin entirely within the home, began to be so important during the

¹ From Drake, *Pioneer Life in Kentucky* (p. 96): "December was our 'killing time.' I shall not take you to the hog pen, nor to the scalding tub, but begin with the cutting up of the fat, a work to which boys are well adapted. The fat being 'tried' out the next labor was chopping sausage meat which I began with a hatchet because too small to lift a heavier tool, and continued until I could use the axe with a vigorous arm. The stripping, twisting into links, hanging on poles and moderate smoke drying succeeded. Lastly, the frying of the feast, for in those days of simple fare, the annual return of the sausage season was hailed by the whole family. To this hour I prefer good and specially clean sausage to any other meat. . . .

"Other dainties awaited us as the result of killing hogs—doughnuts and crullers, boiled in fresh lard till they assumed a beautiful faun color are still my favorites. Also delicious mince meat—wielded chopping axe in this manufacture many an hour."

second decade of the nineteenth century that the packing on the farm of the surplus supply of pork and beef was insufficient to meet the demand. This was especially true in the New West. In a previous chapter it has been noted that there had been packers of meats in the eastern colonies and states. It is probable, although there is no satisfactory proof, that pork was cured and packed in barrels in Salem, Massachusetts, as early as 1640. This fact is certain that Boston and many other places did quite a trade in that line not long after that date. These establishments, however, were small, and were largely so much a part of the butcher's trade that what may be termed regular packing establishments, as the word is understood today, were probably not built up in the East until after the industry had developed somewhat in the West.

First Western Packers at Cincinnati

It would appear from the records that the first regular packer in the West was Elisha Mills, a downeaster who established himself as a packer in Cincinnati in 1818.² However, it is probable that there were some small packers—farmer-packers—as early as 1811.³ Their plants grew steadily, and by 1830 pork packing was evidently a coming industry. By the winter of 1832–1833, there were several establishments at Cincinnati, and in that season it was claimed that 85,000 hogs were slaughtered there.⁴ It was in that period that a definite annual statement of pork packing in the West was begun by Charles Cist of Cincinnati. As one writer summed it up:

It was Cincinnati which originated and perfected the system which packs fifteen bushels of corn into a pig and packs that pig into a barrel, and sends him over the mountains and over the ocean to feed mankind.

² Armour, P. D., *One Hundred Years of American Commerce* (Ed., Chauncey M. Depew); see also *Western Farmer* (1841), Vol. II, p. 229. John Mahard, Jr., was a packer in Cincinnati and later in Covington.

³ *Western General Advertiser*, Feb. 25, 1846.

⁴ U. S. Agricultural Report, 1847, p. 325.

Advantages of Cincinnati

In the decade of 1820-1830, Cincinnati rapidly rose to be the "Queen City of the West." Situated on a great bend of the Ohio River which brings it into the interior of the Northwest in the rich farming country between the two Miamis and opposite the Licking River, it became naturally the center of the large fertile region of Ohio and Kentucky.⁵ In 1830, it had a population of nearly 25,000 souls, and with the exception of New Orleans was the largest city of the West. The center of steamboat building, Cincinnati was the natural port to which goods from the East were consigned. It was for the same reason the place through which went the exports of Kentucky and Ohio.

A second great advantage that Cincinnati had, lay in its superior transportation facilities. At first the Ohio River afforded the best means, but Cincinnati did not show phenomenal increase in the number of hogs packed until the years 1838-1842 or, in other words, until transportation facilities in the Middle West itself, radiating from Cincinnati, made possible the concentration and marketing in that city of the live stock of the surrounding region. It was this improvement in local transportation followed a little later by the building of the railroads uniting the Central West with the East, which promoted the livestock trade of Ohio, Illinois, and Kentucky. A great increase in the values of cattle, sheep, and hogs resulted from this closer and more rapid communication, between West and East as well as that between West and South, and provided a stimulus to livestock improvement.

The ensuing revolution in the livestock industry in turn encouraged the packing industry in Cincinnati, though in the

⁵ *Atlantic Monthly*, Vol. XX, p. 232. *Cincinnati Western General Advertiser*, Oct. 16, 1844: "Shay, the father of the pork-packing business here, put up pork in 1827, and I well recollect cart loads upon cart loads of spare ribs, such as could not be produced elsewhere at the east . . . drawn to the water's edge and emptied into the Ohio to get rid of them. The influx of Germans and the rapid increase of inhabitants from 1830 onwards gradually opened a market for these delicacies, as they would be esteemed if they were scarcer and costlier, and obviated such scandalous waste; but even yet a man may get a market basket filled with tender-loins and spare-ribs for a dime."

fifties the great trunk railroad lines with the movement westward of the cattle country, gave Chicago the lead over Cincinnati. Up to the Civil War, however, Cincinnati was the chief center of the pork packing industry in the United States.

In addition to its location in the stock raising region, Cincinnati owed its leading position to its superior banking facilities, for the packing industry demanded that large sums be paid in ready cash. Again, it was often necessary to employ at short notice large gangs of laborers and coopers, thus making the location of a packing plant most advantageous where the demand could be most readily supplied. The necessities of the trade also required an ample supply of salt, and this could be obtained readily at Cincinnati. An added advantage was found in the denser population that afforded a market for the surplus product. In the winter of 1831-1833 there were several establishments at Cincinnati, and in that season it was claimed that 85,000 hogs were slaughtered there.

Description of Cincinnati Packing

In those early days the packing was confined almost exclusively to the curing and packing of hog products and much of the slaughtering was done by the farmers. In 1844 there were 26 packinghouses in Cincinnati; in 1853-1854 the number had increased to 41, and in 1855-1856 to 42.⁶

About 1845 the novelty and size of the industry had increased so that the whole country was interested and many accounts of it were written for public information. In that year a Cincinnati journalist made this statement:

The putting up of pork has been so important a branch of business in our city for five and twenty years, as to have constituted its largest item of manufacture, and acquired for it the *soubriquet* of *Porkopolis*. . . . Our pork business is the largest in the world, not even excepting Cork, or Belfast, in Ireland.

⁶ *The National Provisioner* (Sept. 13, 1902), Vol. XXVII, No. 11.

The centering about Cincinnati of an industry of such importance was recognized as a great asset. The value of these manufacturing operations to the city consisted in the vast amount of labor required and the fact that the great amount of necessary work furnished employment to thousands at the very season when their regular jobs could not be followed.

The slaughtering, wagoning, pork house labor, the rendering of fats into lard and grease, the production of lard oil, stearin, soap and candle products, bristles and curled hair, the making of lard kegs, pork barrels, bacon and lard boxes, and other employments supplied sufficient work to men, who in the spring and summer were otherwise engaged in the manufacture and hauling of bricks, quarrying and hauling stone, cellar digging and walling, bricklaying, plastering and street paving, etc., which ceased when winter came. It is easy to appreciate the importance of a business which supplied labor to probably 15,000 people who, but for its existence, would have been earning little or nothing for one-third of the year.

In the early stages of pork packing, for example, in 1828, there was so little demand for any portion of the hog, other than hams, shoulders, sides, and lard, that the heads, spare ribs, neckpieces, and backbones were regularly thrown into the Ohio River to get rid of them.

Development in Other Cities

Following the example of Cincinnati and with the development of the agricultural resources of the western states, which cheapened the cost of producing hogs and stimulated production, and encouraged by the demands from southern and eastern markets, the undertaking of pork packing naturally followed at other western towns more or less directly in touch with river navigation, as, for example, at Louisville, Kentucky.

This development in hog packing that was going on in the Ohio Valley far outstripped that industry in the East. In fact, as one writer summed it up:

The farmers in the Eastern States can form no idea of the extent of pork trade of the West, unless they personally inspect the slaughtering houses that are to be found in Cincinnati, and other large cities. Twenty thousand are very commonly slaughtered and packed for market in a single season by one house; and the whole number slaughtered annually in these establishments west of the Alleghany mountains, averages 2,000,000, weighing each 200 lbs., of net pork, of which at least one-fourth are slaughtered in Ohio. The number packed at Cincinnati alone, equalled 400,000 head in a single season. During the month of December, the latter city is crowded almost to suffocation, with droves of hogs, and draymen employed in delivering the barrelled pork on board of steamers. Some 1,500 laborers are employed in the business from six to eight weeks, and in many cases it is kept in full operation both day and night, including Sundays, from the beginning to the completion of the season.⁷

Effect of Foreign Demand

During the forties the business of Cincinnati increased to such an extent that Porkopolis was known all over the world, and this growth was largely brought about by the foreign demand. For years Cincinnati had catered to the negro trade of the southern planters and also had sent large quantities to New Orleans for shipment abroad. By 1844 the value of hog products shipped to New Orleans was \$2,795,676.

In the forties the foreign demand for lard became much greater than ever. The lard made in Cincinnati was exported in packages for the Havana market, where, besides being extensively used for cooking as in the United States, it served as a substitute for butter. It was also shipped to the Atlantic markets for local use, as well as for export to England and France, either in the shape it left, or in lard oil, large quantities of which were manufactured in the East.⁸

An impetus was given also by the fact that about this time the great discovery was made that lamp oil could be extracted

⁷ *The Cultivator* (1851).

⁸ *Cist's Advertiser*, April 4, 1848.

from hog lard. One writer ventured to say "that not even the discovery of the art of printing could have given such widespread delight through the western country. Here was death to the whale fishery, spermaceti and all." The lard yielded not only the oil, but it could be divided, and the other half used for sperm candles. The use of lard oil almost entirely superseded that of the whale in all the western region. This annually consumed a considerable number of hogs and transferred the labor and pay for it from the ocean to the prairies.

In these years an unprecedented share of pork was put up expressly for the English market. Fresh American pork had become quite an article of traffic in the Liverpool market, where it was bought readily at prices which paid a good profit to the shippers on this side. According to the *New York Herald* this trade was first started by a Captain Yeaton, when he commanded the packet ship "Oxford." Yeaton, as he was about to sail one winter's day, saw a lot of fine looking dead pigs hanging up in Fulton Market. The idea occurred to him that they might prove a good speculation, and if nothing could be made on them in Liverpool, he could use them as ship's provisions, and thus save himself from loss. The speculation did turn out well and was repeated several times with great success.

By 1848 we find Cincinnati pork packers building up a foreign business in Germany. A Cincinnati firm, Messrs. Bowen and Envart, added in 1848 a new department to the pork business of Cincinnati, cutting and putting up pork for the German markets, on orders from Westphalia, which required the products of 15,000 hogs.

Eastern Meat Packing Growth

It was to meet the growing demand for pork products abroad and in the eastern states, on account of their increasing population, that in Boston, Providence, New Haven, New York, Philadelphia, Baltimore, and Pittsburgh, packinghouses arose on the same plan and model as in Cincinnati, now the

recognized Porkopolis of the United States. For example, in Boston, during the forties, was founded a pork packing establishment which is still an important factor in the eastern section of the industry, though now owned by the G. F. Swift estate. In 1842 John P. Squire and Company was organized by John P. Squire, who in that year began a provision business at Stall No. 25, Faneuil Hall Market, Boston. The actual hog slaughtering establishment dates back to 1855, when Mr. Squire bought a small tract of land in East Cambridge and built a packinghouse there.

Up to the middle of the nineteenth century there are practically no government statistics for the meat packing industry. Since we have reached a time when there were fairly reliable figures gathered, it may be well to include in this chapter a statement summarizing the growth of the industry in figures.

As we have seen during the ten years covered by the eighth census, taken in 1860, the center of the meat industry was at Cincinnati and in the Ohio Valley. The average amount of capital invested per establishment increased from \$18,824 to \$39,221, or 108.4 per cent, while the average value of products per establishment increased from \$64,766 to \$113,675, or 75.5 per cent. From that time concentration in definite centers was a marked feature of the growth. The effects of the industrial crisis of 1857, with its wholesale reduction of wages, is seen in the difference in the average yearly wage paid in 1850 and 1860. In 1850 it was \$376, which decreased to \$202 in 1860, a decrease of 46.3 per cent. The winter packing in eight principal western cities grew from 720,500 hogs in 1850 to 992,310 hogs in 1860.

In the decade from 1860–1870 there was a still greater relative growth. The number of establishments increased by 509, or 196.5 per cent, the largest increase in this item in the half-century. The sum of \$14,066,330 was added to the capital invested, 3,308 wage-earners more than formerly found employment, and the benefit to the stock raisers is shown

approximately in the increase of \$38,109,591, or 161.7 per cent for materials used. The value of the products increased \$46,384,724, or 157.5 per cent. It should be remembered, however, that these values were expressed in a currency which was at a discount in gold and that had to be reduced one-fifth for purposes of comparison with other census years.⁹

Meat Packing in Illinois

Having traced thus far the general development of the packing industry in the West from the time it was established in Cincinnati and seen it spread to other cities, it is well to consider the growth of the industry in Illinois, which became the meat packing state par excellence with the predominance of Chicago.

The first packing establishment in Illinois was located in Madison County, near the mouth of the Wood River, a small stream which enters the Mississippi a few miles below the present location of Alton, where, as early as 1818, there was an "extensive packing house, which packed both beef and pork for foreign markets."¹⁰ Beef and pork were abundant in this region after 1820,¹¹ but the scarcity of specie and the disastrous failure of some of the local banks made the prices of produce so low that little encouragement or stimulus was given to farming or to the industries which dealt with farm products, until the United States Bank brought relief to the situation about the year 1826.

In 1821, Alton, then a village of only "thirty-two families and one hundred and seventy souls," had, in addition to the inevitable sawmill, a warehouse for packing beef and pork, and

⁹ "Slaughtering and Meat Packing," by Harry C. McCarty, of the Livestock Division, U. S. Census Office, in *The National Provisioner* (July 26, 1902), Vol. XXVII, No. 4.

¹⁰ *Alton Telegraph*, Jan. 28, 1875, in an article by S. P. Gilman, one of the earliest settlers in Madison County. The compiler of the "History of Madison County, Illinois, 1882" (p. 418), quotes this article almost verbatim. Philip D. Armour, in his article on the packing industry, in "One Hundred Years of American Commerce" (Vol. II, p. 283), says: "The paternity of the Western packing business, as we understand it today, belongs, I think, to Cincinnati. In 1818, one Elisha Mills, a 'down-easter,' was established as a packer in Cincinnati."

¹¹ Brown, Michael, in *Alton Weekly Telegraph*, Oct. 22, 1875.

its natural associated establishments, a slaughter house, a tannery and a cooper's shop.¹² Its location at a vantage point on the Mississippi River made it a natural market for livestock and provisions, and in 1832, with a population which had increased between 500 and 1,000, "numbers of hogs and cattle were here slaughtered for the New Orleans market."¹³

Packing at Alton and Other Towns

At the beginning of 1837, Alton had four large packing-houses, and the value of the pork packed and prepared there for market ran up into the hundreds of thousands of dollars. It was the intention of the proprietors to make Alton the central depot for these great staples. Alton, however, had no monopoly over the business of pork packing, as regards the other towns of Illinois, though St. Louis, its great commercial rival in other respects, apparently packed little pork or beef, preferring rather to act as a point of reshipment than as a point where the packing was actually done. Beardstown, a hamlet on the Illinois River six miles below its union with the Sangamon River, was Alton's earliest competitor, and had by 1833 a fairly well-established business.¹⁴ The first packer in Quincy barreled 3,000 hogs during 1836, in his initial season,¹⁵ and the combined exports of flour and pork from that town for the year 1837 were valued at \$100,000.¹⁶ 1837 witnessed the beginning of the industry in Peoria,¹⁷ and it is probable that Meredosia and the other Illinois River towns where the business is later found, had likewise embarked on the enterprise by this time.

¹² History of Madison County, Illinois, quoting from Peck, Guide for Emigrants (1831).

¹³ Baird, Robert, View of the Valley of the Mississippi, p. 212.

¹⁴ Perrin's "History of Cass County, Illinois" (p. 31) tells of the shipments of pork for 1833. In 1829, the year in which Beardstown was founded, an advertisement in the first issue of the *Galena Advertiser* (July 29, 1829), offered to supply the mining district with pork, beef, flour, etc., from Beardstown, which was stated to be the market for the produce of Morgan, Sangamon, and Schuyler counties, at the same freight rates as charged from St. Louis. This may have referred merely to country-cured produce, but it is at least suggestive that the industry may have had a very early start at this point.

¹⁵ History of Adams County, Illinois, p. 265.

¹⁶ Mitchell, Illinois in 1837, p. 138.

¹⁷ History of Peoria County, Illinois, p. 543.

Early Chicago Meat Packing

To complete the study of the beginnings of the packing industry in Illinois, the history of packing at Chicago alone remains. Although meat packing began at Chicago almost as early as it did at Alton, it is clear that the industry at the former place had little in common with that in the southern part of the state. The pork and beef packed at Chicago was sent to Buffalo, Rochester, or Detroit by way of the Great Lakes; that from the Illinois and Mississippi river towns went to New Orleans, where it was sold to the cotton planters, or reshipped to the eastern states, to the West Indies, or to European markets. Although the products from Chicago might ultimately compete in the distant New York market with those from the other Illinois towns, the competition there was of such a negligible quantity, if it occurred at all, that the packers and commission merchants of Alton and St. Louis did not think it important enough to mention. But the present immense proportions of the meat packing business in Chicago make a detailed statement of its early history as regards the names of packers, the location of the plants, and the various minor details concerning the conduct of the business, both interesting and important.

The first slaughter house at the settlement of Chicago was said to have been built in 1827 by Archibald Clybourne, government butcher for the Pottawatomies, for the purpose of supplying the garrison and settlers with meat.¹⁸ The first packing was not undertaken, apparently, until 1832. In October of that year George W. Dole purchased from 150 to 200 head of cattle from a gentleman at Hickory Creek in the

¹⁸ In Andreas' "History of Chicago" (Vol. I, p. 561), an account is given by Sylvester Marsh of his early experiences in Chicago. When he came to Chicago in 1833-1834, provisions were all taken from Ohio to support the little community of 300 persons. This looked like a business opportunity to Mr. Marsh, so he engaged in the slaughterers' and drovers' trades, bringing the cattle from the Wabash Valley. He claims that there was no slaughtering house in Chicago at that time, so for the first 60 days of his operations he led the cattle to an old elm tree that stood on Monroe Street, about where the Court House now stands, and there, by means of a tackle, he swung the animals up and killed them. His claim that he was the first to engage in the meat business, even in the supplying of the local market, is not substantiated by other writers.

Wabash Valley.¹⁹ The beeves were driven from this region 150 miles to their purchaser in Chicago; they were slaughtered by John and Mark Noble on the prairie near the lake, at what is now the corner of Michigan Avenue and Madison Street, near where the "palace" of the Episcopal bishop long stood. The packing was done at Dole's warehouse at the corner of Dearborn and South Water Streets. The barrels in which the beef was packed were brought from Detroit, and the beef when packed was shipped to Oliver Newberry of that place. The price paid for the lot was \$2.75 per hundredweight and the product amounted to 287 barrels of pork and 14 barrels of lard.²⁰ In December, 1832, Dole slaughtered 338 hogs which were also driven from the Wabash, the slaughtering being done in the backyard of his warehouse and the packing in the store. There were no barrels on hand when the pork was slaughtered, so the meat was packed in bulk and stored away until the barrels could be made during the winter. The price paid for this lot of hogs was \$3 per hundredweight. This was the first lot of hogs ever packed in the city of Chicago.

First Chicago Pickled Pork and Beef

The large emigration to Chicago during the summer of 1833 created a demand for pickled pork and beef, and to supply this demand Dole and Clybourne purchased more hogs and cattle from the Wabash. Both these men packed their meat at the Clybourne slaughter house on the east side of the North Branch, the former packing 250 head of cattle and 1,000 hogs, and the latter 250 to 600 cattle and from 2,000 to 3,000 hogs.²¹ The cattle cost \$2.50 and the hogs \$3 per hundredweight.

In 1834 Gurdon S. Hubbard moved from Danville to Chicago and engaged in the packing business in the "Old Bank

¹⁹ The former figure is given in the "Seventh Annual Review of the Trade and Commerce of Chicago," published by the *Tribune* in 1858 (p. 17). The larger figure is given in the second volume of the same publication, entitled "The Railroads, History and Commerce of Chicago, 1853."

²⁰ These figures are given in Colbert's "Chicago" (p. 45). (Colbert's statements tally well with the others.)

²¹ Variant figures are given in the "Seventh Annual Review of Trade and Commerce" (p. 17), and in Andreas' "History of Chicago" (Vol. I, p. 561).

Building" at the corner of Lake and La Salle Streets. He purchased 5,000 hogs from Vermillion County, St. Clair County, and Wabash County, and slaughtered them on the South Branch. Being disappointed in getting barrels, he had to put the pork into bulk sides until spring, when he purchased barrels from Cleveland at \$1 apiece and had the pork packed.²² During this season, at the new slaughter house of Oliver Newberry and G. W. Dole, on the South Branch, from 300 to 500 cattle and 1,400 hogs were packed, while Clybourne is said to have eclipsed his record of the previous year by packing 600 cattle and 3,000 hogs.²³ The whole number packed in Chicago during this season, therefore, must have approximated 1,000 cattle and 10,000 hogs.

During the season, 1836-1837, Sylvester Marsh packed 6,000 hogs to supply the contractors on the canal which had just been begun. Up to 1841, Marsh, Dole, and Hubbard were practically the only men engaged in the packing business, Clybourne confining his activities chiefly to butchering for the local market. During the season, 1839-1840, Hubbard packed 4,000 cattle and 10,000 hogs, and during the following season increased his output to 7,000 cattle and 12,000 hogs. No statement of the total amounts packed by these three packers for these years is available. Hubbard's packinghouse was located from 1837 to 1840 on the north side of Kinzie Street, near the Rush Street Bridge. In the latter year he built a warehouse on South Water Street, between Clark and La Salle Streets, which he occupied until 1848, when he moved to the North Branch, East Water Street, between Michigan and Illinois Streets, where his slaughtering had always been done. He purchased his cattle in 1840 from the Illinois River country, McLean County, Fulton County, etc. Marsh's packinghouse

²² The question of dates in connection with the life of Mr. Hubbard seems hard to establish. When, however, we read in his "Life Sketch" by Henry B. Hamilton (p. 157, note), that it was in 1829 that the "barrel" incident occurred, we may be quite sure that the writer is in error. It seems probable that Mr. Hubbard engaged in the drovers' and slaughterers' business at least as early as 1831. (See Chicago Historical Society Publications, Vol. IV.)

²³ Blanchard, *Discovery and Conquest of the Northwest, with a History of Chicago*, p. 421.

was located on Kinzie Street near the Rush Street Bridge until 1853, in which year he retired from the business.

The first decade of the industry at Chicago shows no remarkable features. The center of the state industry of pork packing was at Alton. Only in the packing of beef did Chicago do any business which compared favorably with the down-state town. This first decade of the history of the packing industry in Illinois was also marked by the complete ascendancy of Alton as the chief packing point in the state. The second decade witnessed the growing importance of the packing establishments in the newer towns farther north, while the early part of the succeeding twenty years were distinguished by the phenomenal rise in the importance of Chicago as a beef and pork packing point and by the ultimate concentration of the industry of the state in the great metropolis on Lake Michigan.

Early Packing at St. Louis

The decade, 1840-1850, marks the rise of St. Louis as an important packing point. Hitherto, that city, so advantageously situated at the place on the Mississippi where all the Missouri, Illinois, and upper Mississippi River traffic could be reshipped to larger boats for the completion of the southward journey, had been content to derive its profits from its commissions. Ship merchants were growing rich from Illinois farmers, and were constantly urging the latter to build up their own town of Alton as the competitor of St. Louis. By 1845, however, the "back country" of Missouri began to furnish hogs and cattle in increasing numbers and the packing business rapidly grew to such an extent that the city soon became a good market, not only for Missouri, but also for large numbers of Illinois hogs, which, if the older conditions had remained, would have gone to Alton. The decade, 1840-1850, at Chicago was not marked by any great increase in the volume of business done in the packing of beef and pork, although the number of firms engaged in this business gradually increased,

and the foundations were laid for the rapid development of the industry following the building of the various railroads at the beginning of the second half of the century.

Development in Chicago

During the season of 1842-1843, Archibald Clybourne again did some packing. On this occasion about 3,000 head of cattle were put up for William Felt and Company, extensive farmers and commission merchants of Rochester, New York. This is alleged to have been the first beef packed in Chicago for an eastern market. A directory of the city states that in 1844 four large packinghouses were doing a large business.²⁴ Of beef, 14,856 barrels were put up, the major portion of which was used in the city; while the amount of hogs killed and packed exceeded that of any previous season. This directory shows that, although Chicago owed her pre-eminence primarily to the fact that she was a very important grain exporting center, beef and pork products bore a relatively important relation to the other products exported.²⁵

During the season 1844-1845, Julius W. Wadsworth, of the dry goods and grocery firm of E. S. and J. Wadsworth, became the partner of Dyer and Chapin in their packing operations. This firm in 1845 packed the first tierce of beef ever put up in Chicago for the English market. The next season Chapin dropped out of the firm, and for the next five years the firm continued as Wadsworth, Dyer and Company. This firm was the most important in the city for several years. In 1845, it was doing two-fifths of the business of packing beef, putting up about 100 beeves each day, and as late as the

²⁴ The relative amounts of packing and other commodities produced in Chicago at this time are given as follows:

	1842	1843		1844	1845
Beef	762 bbls.	10,380 bbls.	Wheat	586,907 bu.	128,967 bu.
Pork	15,447 "	11,112 "	Corn	35,358 "	2,443 "
Hides	6,947 "	14,536 "	Oats	53,486 "	3,767 "
Lard	367,200 lbs.	2,823 "	Flour	2,920 bbls.	10786 bbls.
Tallow	151,300 "	1,133 "	Furs	446 pk.	393 pk.
Wool	1,500 "	22,050 lbs.			

²⁵ Curtis, *Western Portraiture and Emigrant's Guide*.

World's Fair in 1893 the beef packed by Wadsworth, Dyer and Company received much attention and credit.

Railroads Change Packing Centers

With the opening of the Chicago and Michigan Canal and the operation of the spurs of railroad which radiated from Chicago, after 1850, several changes took place.²⁶ In the first place, prices all along the Illinois River had come up to the prices paid at Chicago and this speedily caused a large decrease in business at the smaller points, whose chief basis of existence was found in the fact that they were able to secure hogs at a lower rate than was current at the larger packing points from those farmers who did not prefer to drive their herds any distance. A correspondingly large increase, on the other hand, is to be noted at Chicago, Peoria, and Quincy. Beardstown held its lead by a narrow margin until the season of 1851-1852, when both Chicago and Peoria packed more hogs than did the former place. As long as the rivers were the main channels for carrying merchandise and produce, Beardstown could compete successfully with any packing point in Illinois, being even important enough to attract attention at Cincinnati. But the coming of the railroad era banished forever the supremacy of Beardstown and the river points in pork packing circles.

The packing establishments in the large cities had so many advantages over those in the little river towns that it was a foregone conclusion that, with the removing of the problem of transportation, the livestock would be sent to the more advantageous market in the city, while the business of packing in the smaller places would languish. This was the universal effect on the packing industry of the coming of the railroads.

The general effects of the advent of the railroads on the packing business are even more apparent when one recalls that it was only after the first lines were built from Chicago, that the city began to assume any importance as a packing

²⁶ *Prairie Farmer* (Sept., 1851), Vol. II, p. 382.

point for pork products. During the season of 1852-1853, over 48,000 hogs were packed by Chicago establishments, which was more than twice the number packed in the city during the previous season. More than 320,000 hogs were packed in the state of Illinois during the season of 1852-1853, and about one-seventh of this total was packed at Chicago. Three seasons later, in 1855-1856, of the 375,000 hogs packed in the state, Chicago packed more than one-fifth of the total. Peoria and Quincy were still close behind Chicago in 1855-1856, with 55,000 and 43,000 respectively as the total for the season. Alton, Beardstown, Canton, and Springfield packed between 20,000 and 30,000 hogs each, and not another town in the state packed 10,000.

Summer Pork Packing Begun

About 1857 the packing of hogs in the summer was begun in Chicago on a small scale. The monetary crisis of 1857 cut short packing operations in the spring, and from May to the close of the summer two Chicago firms packed more than 37,000 hogs. The action of these "ice packers," together with those of the eastern livestock buyers, rendered the market quite active during the summer of 1858. Ice packing soon began to manifest superiorities over winter curing; the animals cost less and fresh cured hams and fresh lard found preference in the market over the very best winter curing. Thus the pork trade began at this time to undergo a certain revolution. The business of packing which had come to be confined to a few very favored points, and restricted to a few weeks of winter weather, and which demanded the largest and fattest of animals, could now spread over the whole year. It could be done wherever cheap ice could be secured and offal disposed of to advantage, and the bulk of the animals required would be younger and carrying less flesh than those formerly used.

The statistics show that other places besides Chicago experimented to a certain extent with summer packing

through the years that followed. Quincy, for instance, during the summer of 1871, packed 10,000 hogs, and during the following season half that number. During the summer of 1872, there were 95,000 hogs packed at Chicago, not a very large amount when considered in the light of the whole number packed during the whole year, yet the absolute number was large enough to show that summer packing was bound to become important.

From this time forward the history of the packing industry in Illinois is little more than that of the packing industry in Chicago. The 8 packers engaged in the business in 1851 had increased to 58 in 1864. There was a steady increase in the number of hogs packed in Chicago until, during the season of 1861-1862, the half-million mark was passed for the first time. This season was the first during which the packing business done at Chicago exceeded that done at Cincinnati. Never again did the Ohio metropolis regain her place as the chief packing point of the country. By 1862 Illinois held first place in meat packing, a position she has never since yielded.

CHAPTER V

EARLY MEAT PACKING—TECHNIQUE

Early Packing a Winter Industry

The packing industry of the early days was, above all things, a seasonal industry. Before the adaptation of refrigeration to this business, packing operations could be carried on only during cold weather. The first frost heralded its beginning and the last thaw hastened its close. The largest volume of business was carried on during the "dead of winter," when steady, but not intense, cold prevailed.

The season for the slaughtering and packing of cattle always began before that of hogs. The first frost caused a withering of the grass of the prairies which constituted almost the only food for the cattle. The same frost completed the ripening of the corn on which the hogs were to be fattened for from three to six weeks before being taken to market. Therefore, after the first frost the season for the packing of cattle opened. This usually ranged from the middle of October to the first week in November.¹ At Chicago in 1848 the first beef was packed on September 26, which was commented upon as being unusually early.

Packers were always anxious to begin operations as early as possible. At many of the packing points navigation was closed during the greater part of the packing season, so that all the beef or pork which they could get to the eastern market before the winter's ice caused a cessation of shipments, would

¹ For aid in gathering material on early meat packing in Illinois, its technique and financing, the author is indebted to Mr. Clytus A. Freeman, who embodied part of the results of his research in an unpublished thesis at the University of Illinois.

command, as a rule, better prices and have a readier sale than the larger consignments which would be shipped later on.

Length of Packing Season

The season for the packing of hogs usually began somewhere between November 1 and November 15, though at Chicago, Galena, and such northern towns operations in pork sometimes got under way even earlier than this. The length of the season was determined by the state of the weather, the supply of animals, the condition of the money market, etc. Sometimes the season was practically over by the middle of January; sometimes operations had not yet ceased in March.

The packing season of the early days was almost never a time of continuous work, day after day. A great many elements combined to break up the continuity of operations. One of the most common causes of the suspension of slaughtering and packing was unfavorable weather. A thaw or a rain almost invariably caused the packers to fear that the meat would become spoiled, and on the other hand, when it was very cold, the workmen were unable to continue their occupation in the frail buildings which were necessary for the business. Sometimes a supply of animals did not come along in sufficient amounts to keep the establishments running to their full capacity. Severe or stormy weather, even if not cold enough to stop packing operations, would cause the drovers to hesitate to bring the animals across the prairies. The roads might also be quite as impassable on account of mud as because of large drifts. Financial difficulties not often caused very light purchases or none at all, the oft-recurring panics and periods of "tightness in the money market" being second only to the weather as a cause of the interruption of packing operations.

Labor Supply Sources

The seasonal character of the early packing industry furnished an opportunity for employment to many men who

followed entirely different occupations during the rest of the year. A large amount of labor was required at precisely the season when many of the regular vocations of the workmen could not be pursued. Thus, employment was given to a large number of "city" coopers, who were set to making lard kegs and pork barrels and hogsheads at a period when stock barrels and other forms of cooperage were not in demand, and also to "country" coopers, whose main occupation was farming, during a season when their farms required no labor. Another large body of men whose main work was agricultural, was engaged in getting out staves and heading and in cutting hoop poles and other like tasks for the same business. The slaughtering, pork house labor, rendering of fats into grease and lard, manufacturing of stearin, soap, bristle dressing, and so on, supplied abundant work to men who in the spring and summer were engaged in the manufacture of bricks, in quarrying, cellar digging, bricklaying, plastering, and street paving. In addition to this, the hauling of meat from the slaughter houses to the packinghouses employed many teamsters who under ordinary conditions would have found it difficult to get work at that season of the year.

Packers ran great risks due to changes of weather and consequently, in order to save their goods, often needed a very large force of laborers for an emergency, in addition to the force regularly employed, or in cases where they had suffered a disappointment in their previous arrangements. Only a large city could meet such unforeseen demands, and this consideration undoubtedly aided Cincinnati and Chicago in gaining superiority over other packing points.

The usual working day was 8 hours at Cincinnati and 10 hours at Chicago,² but not infrequently laborers were called

² Thus the *Peoria Register* states that one workman of that city cut up for packing in a workmanlike manner 300 hogs averaging 246 lbs. in 11 hours and 48 minutes; and the next day 253 hogs, also averaging 246 lbs. This was pronounced a great day's work for one man. (*Alton Telegraph*, Feb. 5, 1847.) Cist, *Cincinnati Miscellany* (Vol. II, p. 318), says: "Two hands in one pork house cut up in less than 13 hours 850 hogs averaging 300 lbs."

upon to work for a much longer period, as an emergency demanded.

The Early Packinghouse

The subject of the early packing plant is the logical successor of the description of the meat packing season. This was originally very simple in structure. It was, in fact, nothing more than a warehouse used during the major portion of the year by commission and wholesale merchandise dealers, and was only devoted to packing purposes during the winter, when it could be employed in no other way. Almost the only paraphernalia necessary were the large vats in which the pickle was kept. With the increasing importance of the business, however, houses used only for packing purposes, or for slaughtering and packing, were erected at the more important points. In addition to the packinghouse, there was often a lard house and a smokehouse as an integral part of the plant.

There were at least three rooms in an ordinary packing plant, though in a small building the operations, which would usually be performed in separate rooms, might be carried on in the same one. One room was used as a storeroom for the carcasses, newly arrived from the slaughtering establishments, and was also a cutting and weighing room. Another was the storeroom where the barrels filled with the pickled meat remained awaiting shipment. The third was the room in which the large tanks containing the pickle were situated. The tanks were huge iron affairs in which the meat was placed for twenty-four hours before being packed. Originally tubs were sufficient for this purpose, and in the early days when packing was done in some commission man's warehouse, the large vats were probably not a part of the equipment. The cellar was often used for storage purposes.

Most, if not all, of the work in the earliest packinghouses was done by hand, but mechanical devices to lessen labor became more common year by year. In 1836 a steam engine,

just introduced into one of the packinghouses for the purpose of grinding sausage meat, was considered a great curiosity.³ The pickle in which the meat was placed had to be changed several times during the process of curing. At first the pickle was carried in pails from tub to tub. An improvement on this was the pumping of the liquid by hand. The final introduction of rudimentary steam pumps for this purpose was heralded as a seven-day wonder. A further improvement which lessened the amount of time and labor necessary was brought about by the weighing of the meat in the pickle. Many such examples could be cited.

Early Meat Packing Methods

The methods of meat packing became matters of greater intricacy and of greater care as the volume of the industry increased and the extent of the market of the products enlarged. In the earliest days the meat was merely cured and packed and no further attention to "method" was deemed necessary, but when an attempt was made to introduce American meat into England, the packers found that they had to deal with a purchasing public more fastidious in its tastes than that of their native land.

The first method of the packing of beef for the English market appears in newspapers soon after 1840. This beef product soon grew in favor and found comparatively ready sale, and with the modification of the tariff law in 1843, American pork, beef, lard, and bacon were imported into England on a rather extensive scale. The Britons would have none but the best, and English importers of American meat products often found it necessary to issue warnings to the western packers that "more care and cleanliness must be given, before any permanent improvement in the demand can take place."

Minute directions were given to the American packers to

³ *Alton Telegraph*, Feb. 3, 1836.

aid them in satisfying the English market.⁴ Only fat cattle were to be used for export purposes, the entire carcass, except the head, feet, and legs, being cut into pieces of 8 pounds each. Dry salt was first well rubbed into the meat, and it was placed in huge tubs or vats filled with pickle and with enough saltpeter to give a bright color and proper consistency. In 24 hours, as soon as the blood was sufficiently purged out, the beef was to be removed to fresh pickle, and after a time to a third set of tubs, where it remained until packed for exportation. The pickle had to be strong enough to float an egg. Saltpeter was to be a part of the first compound only.

Beef Packing for British Markets

The meat for the English market was packed in tierces containing 38 pieces, a total weight of 304 pounds of meat, in addition to which the weight of the salt and the pickle made the huge casks very much heavier. Since it was very important that when the beef was opened it should present a slightly appearance, great care had to be exercised to trim the edges of the pieces and to lay them in smoothly. Between each layer of meat a layer of salt was placed, and over the whole two or three inches of coarse salt. For the pickle, fine, crushed salt—Kenawha, New York, or Liverpool—sufficed, but for the salt which was packed around the cured meat, only coarse sea salt could be used, Turk's Island or St. Ubes being most usually employed. Marine salt was used exclusively, after it was discovered that native salt destroyed the brightness of the meat, making it dingy and yellow, and wholly unsalable in England or on the Continent. Two iron hoops were placed around the tierce after it had been packed and headed, in addition to the ordinary wooden hoops, and through a hole bored in the head of the tierce 4 or 5 gallons of pickle were poured in over the meat. Then the hole was plugged and the meat was ready for shipment to its distant destination.

⁴ *Ibid.*, Dec. 9, 1843. Hunt's *Merchant's Magazine* (Jan., 1844), Vol. X, p. 87.

Pork Packing for Export

The same process of curing was used for pork as for beef, but while fat beef was demanded for the foreign market, only light pork would be received. Europe wanted no fat pork, at any price. The pieces had to weigh 4 pounds each, and were packed in barrels of 50 pieces, or 200 pounds. All parts of the carcass could be used except the head, feet, legs, and knee-joints. The first pork sent from Cincinnati and other western packing points to England was of such poor quality that it did not give satisfaction, and in this case, as with beef, it was only when packers, cutters, and hewers had been brought over from Cork and Liverpool that the products were packed in a manner satisfactory to the fastidious Briton.

Unless great care was exercised in the curing of the pork there was danger that it might not keep. One of the risks of early-season packing was that the heat might spoil the meat before the salt had penetrated it sufficiently. Again, if the meat were put in the brine before it had become thoroughly cooled, it caused a fermentation in the pickle, which in turn produced a disease in the meat called "measles," that rendered it unwholesome.

The cleaver divided the hog into three parts—hams, shoulders, and middles. The pieces thus cut underwent further trimming to get them in the proper shape for the market. The size of the hams and shoulders varied with their appropriate markets and with the price of lard. When lard was high the pork packer was tempted to trim very close, if, indeed, he did not render the whole shoulder into lard. The different classes of cured pork were made from different sizes and conditions of hogs, the finest and fattest making "clear" and "mess" pork, while the residue was put into "prime" and bacon. The inspection laws required that "clear" pork be made of the sides with the ribs out, and it took the very largest hogs to receive this brand of meat. "Mess" pork had the entire sides with two rumps to each barrel. For "prime"

pork, hogs of a much lighter weight would suffice; two shoulders, two jowls, and sides enough to fill the barrel made up the contents.⁵

Different Kinds of Pork Packed

Most of the "clear" pork packed in the West was sold in New England, where nothing but the best would be accepted. Not a little of it went to the cod and mackerel fisheries. "Mess" pork was largely used by the commercial marine and by the various governments for their navies. Pork destined for the navy, whether it was for that of France, England, or the United States, was put up under the specifications made out for the purpose, hogs of a certain weight being often designated for the purpose. Prime pork was packed for ship use, and for the southern markets whence it was sold to the plantations in the cotton states and in the West Indies. With the acquisition of California a great deal of the pork found a market there.

"Bulk" pork was intended either for immediate use or for smoking. The former class was shipped on flat-boats down the Mississippi during the winter, but it formed no large part of the whole. By far the greatest portion of the bulk pork went immediately to the smokehouses where it was kept, as far as possible, until ready for shipment. It was then packed in hogsheads containing 800 or 900 pounds, the hams, sides, and shoulders each being kept by themselves. Bacon was sold in large quantities to the iron manufacturing districts of Pennsylvania, Kentucky, and Ohio, to the fisheries of Pennsylvania, Maryland, and Virginia, to those engaged in the coasting traffic, and to the inhabitants of the Mississippi above New Orleans.

With the enlargement of the market for western products, many new cuts of pork were introduced. Some were called by their English names, e.g., Cumberland, Stratford, etc.

⁵ Cist, Cincinnati in 1851, p. 281.

Some were merely combinations of the cuts of the earlier days, e.g., "prime mess," "long and short middlings," etc. The same general grading of the meat was used, however, wherever pickled pork was sold.

Pork and Beef Inspection

Very strict laws of pork and beef inspection were enacted, and certain points were specified where the official inspectors overhauled each barrel of pork, made sure that it was in good condition, and that it corresponded with the requirements for the particular grade for which it was to pass. Inspected meat brought higher prices than that which was not inspected. The main advantage of official inspection was to increase the confidence of purchasers abroad in the soundness of the provisions found in American markets, and to set a standard by which certain grades could be designated. The courts ruled that an inspector was responsible in giving his warrant regarding the condition of the meat, not only for certifying that the meat was in good condition when he examined it, but also that it was in a sound enough condition to be fit for sale within a reasonable length of time thereafter.⁶ Inspectors who did not show due diligence in the discharge of their duties were liable to suit for damages.

The sole business of the packer of pork and beef of the early days was that of "packing." The present integration of the industry has caused us to think of the slaughtering and dressing the carcass, and of the various processes by which the waste products were utilized, as inseparable parts of the business of packing. This idea is, however, the result of experience with the conditions of the present day, but an examination of the business of meat packing when it first began to attain importance discloses conditions which were entirely different.

⁶ Hunt's *Merchant's Magazine* (Aug., 1848), Vol. XV, p. 185. Decided by the Supreme Court of Louisiana, June 22, 1847, in the case of *Pardos v. Bozant*.

Slaughtering and Packing Kept Distinct

The business of butchering was begun before that of meat packing, and, therefore, it is to be expected that when the latter began to engage the attention of capitalists, the packers merely made use of the means already in existence. Since the first packers were mostly commission merchants, who packed "on the farmer's account," this tendency toward keeping the business of packing distinct from that of slaughtering was intensified. At Cincinnati, indeed, the slaughter houses were owned by individuals, but were under the supervision of one man who was appointed by the packers in order that the work should be done uniformly.⁷

Slaughter houses were very frail buildings, the usual method of construction being to board up the sides with movable lattice work, which was put up to admit the air at ordinary temperature, but was shut down during the periods of intense cold which occasionally attended the packing season, and which would freeze the pork so that it could not be cut up to advantage. Slaughter houses, almost from the first, for obvious reasons were located on the outskirts of the village, and were usually situated on a stream.⁸ But at Chicago there seems to have been little objection to the slaughtering of cattle or hogs in the village. Before a slaughter house had been built there, Sylvester Marsh, one of the early provision dealers of the city, made use of an old elm tree which stood on a corner of Monroe Street, near where the present court house stands, from which, by means of a tackle, he swung the cattle and hogs he had killed.⁹ The first cattle slaughtered for Dole, Chicago's earliest packer, were also killed and dressed in the open, on the prairie along the lake shore at Madison Street. And the first hogs which were packed in the city were slaughtered in the back-

⁷ The actual condition in 1837 was that Coleman owned 10 of the 21 slaughter houses and supervised the operation of 8 others. See Lloyd, *Western Address Directory*, 1837, p. 280.

⁸ At Cincinnati they were located on Deer Creek east of the city half a mile from the Ohio. During the winter this stream acquired the expressive name of "Bloody Run."

⁹ Andreas, *History of Chicago*, Vol. I, p. 541.

yard of Dole's warehouse at Dearborn and South Water Streets. As late as 1849 there were slaughter houses in the same block as the Sherman House and the Post Office.

Chicago Slaughter House Regulation

It was in the year 1849, due to the strenuous objections of several citizens of the rapidly growing city, that the Council was at last induced to pass an ordinance "to prevent the erection of slaughter houses within the city of Chicago." This ordinance not only forbade the erection, fitting up, or conversion of any buildings in the future for the purpose of "slaughtering, killing or dressing" cattle, calves, sheep, or swine, but also forbade the continued occupation of the existing buildings for that purpose, and imposed a fine of not less than \$10, nor more than \$100, for any violations.

This ordinance caused these slaughtering establishments which had not already done so, to move to a location on the South Branch of the Chicago River, but even in this new location the slaughter houses were soon in trouble with the city, and it was found necessary to flush the sluggish river by pumping water from the canal, in order to cleanse it "from the filth deposited by the slaughter house men, which had so corrupted the water as to make it stink unbearably at every turn of the paddle wheels of the numerous steam boats upon it."

Hog Slaughtering Operations

Operations at the slaughter houses of the early days included more than the mere killing of animals. Sometimes these additional operations were described in advertisements as "slaughtering and dressing." Sometimes the "dressing" was not mentioned specifically, but it was always implied, however. As soon as the farmer or drover sold his hogs to the packer, the animals were driven from the pen adjacent to the packinghouses, where they had been kept awaiting their

sale, into a small pen which was a part of the slaughter house that the packer had chosen for killing and dressing this particular batch of hogs. The animals were packed in this pen until no more could by any means be crowded in, and then one of the workmen entered and walked over the backs of the droves, knocking them on the head, one after another, with a two-pointed hammer adapted to that purpose. The carcasses were then dragged out by hooks to the sticking room where their throats were cut, and the carcasses hung up for all the blood to drain off. After the blood had ceased to flow, the carcasses were passed on to huge caldrons of boiling water, often having a capacity of 1,000 gallons, whence after a moment's immersion, they were removed and tossed upon a large table to be cleansed.

Even at a very early day it was found economical to give each workman a special duty, and as many persons worked on one hog as could get around it. One cleaned out the ears, which had to be done while the hog was reeking with steam. Others pulled off the bristles and hairs, while others scraped the animal more carefully. To show the speed attained, at Cincinnati in 1851, the workmen were able to clean three hogs per minute. As soon as this work was done, the animal's hind legs were stretched apart by means of a stick called a "gambrel," and three men carried the carcass away to another portion of the building, two of them carrying the front part on their crossed hands, and a third grasping the gambrel. These men hung the hog upon a hook, and the "gutter" next stripped out the entrails. This latter process was sometimes accomplished after the carcass had been hung up in the cooling room, which was usually located in the center of the building. After being thoroughly cooled for 24 hours or more, the carcass was placed on a block and the head severed with a large cleaver, and at some slaughter houses the whole carcass was cut up into pieces of the proper size for packing. The carcasses, or the tubs of properly trimmed pieces of meat, were

then hauled to the packinghouses, where the meat was pickled and packed for shipment to the southern and eastern markets.

Methods at Cincinnati

The most complete information regarding methods of slaughtering and packing in the early days is of necessity gathered from writers who told of the business as it was carried on at Cincinnati. The gigantic concerns of this city overshadowed those at any other place. Since practically all the men engaged in the slaughtering and packing operations of the regions farther west served their apprenticeship at the great "Porkopolis," and mentioned their years of experience in that city as an especial recommendation, it is fairly certain that their methods were as closely copied as possible from those practiced at Cincinnati. It is very probable, moreover, that new inventions and improvements were not introduced in the establishments in Illinois and the other western states until after they had been in successful operation at Cincinnati.

Early Division of Labor

We have been accustomed to think that the division of labor which has been so emphasized as peculiar to the packing industry of today is a comparatively recent feature. Actual study of the conditions in the early packing industry leads to quite a different conclusion. One writer of the thirties, indeed, was reminded of the pin factories of Birmingham, made famous for their division of labor by Adam Smith's illustration,¹⁰ and this was the fact first noticed by almost every writer who describes the industry as it was carried on at Cincinnati. In 1837, this process had been expanded so far at Cincinnati that it was "the task of twenty men to knock down, bleed, scald, remove the hair, bristles, and entrails, and have in readiness for the cleavers six hundred and twenty hogs in eight hours, which constituted a day's work in this industry."

¹⁰ Martineau, Harriet, *Retrospect of Western Travel*, Vol. II, p. 45.

Packing was usually done in warehouses situated on the wharves in the days prior to the railroad era, while the slaughter houses were located on the outskirts of the city. This fact introduced another industry into the field, that of hauling the pork from the slaughter houses to the packinghouses. At Cincinnati, in 1835 the average load was from 25 to 40 carcasses,¹¹ and in 1851 the improved streets and better wagons made it possible to carry from 60 to 100 at a load, and even then 50 of the largest class of wagons were employed continuously throughout the season.¹² This work of drayage was an important allied industry until the building of the railroads made it more profitable to have the packinghouses in the suburbs of the city where the slaughter houses were situated.

Slaughtering and Packing Combined

It is not a very difficult matter to trace the gradual combining of the business of slaughtering with that of packing. The separation of these two industries was not a natural one and in Chicago, at least, does not appear to have continued for very long. After the first year or so, when it became clear that packing could be carried on with profit, the warehouses were enlarged, and slaughtering operations were conducted in them as a matter of course. At Alton, and doubtless at many other of the early packing points, the two businesses were kept separate, largely due to the fact that those engaged in the slaughtering business received custom from the local meat market and from the farmers as well as from the packers. As early as 1838, however, there are references in newspapers to the slaughtering of hogs and cattle at one of the packing establishments at Alton.¹³ The combining of the two industries from that time on was rapid, and by 1850 there is little mention of slaughtering being conducted as a business separate from packing. It was customary for the packers to form

¹¹ Hoffman, C. F., *Western Address Directory*, 1837, p. 280.

¹² Cist, Cincinnati in 1851, p. 278.

¹³ *Alton Courier*, April 6, 1855.

partnerships lasting through the packing season with a man who owned a slaughter house, and this naturally led to more lasting unions.

The elimination of the necessity for hauling the dressed beef long distances through the city was not the only benefit which resulted from the combining of the slaughtering and packing operations in one building. Economies of labor, and savings in the use of floor room and in other lines were also effected. The killing of the animals came to be done on the top floor of the packing buildings, an inclined plane being used to drive the animals up to the killing rooms. Sometimes in fact the hog pens were located on the roof.¹⁴ The carcasses were then carried on an endless trolley, while the various processes of cleaning were being carried on. The force of gravity lessened the hand labor necessary, and the meat was cut into proper pieces for packing with little additional work. All these operations seem to have attracted as much attention and interest in Chicago fifty or sixty years ago as they do at the giant plants of Swift, Armour, Morris, Wilson, and others today. And the earlier writers exhausted their vocabularies in describing the operations as carried on at the Cincinnati and Chicago establishments.

Early Cattle Slaughtering

Information about the early methods of slaughtering cattle is less complete than that concerning the slaughtering of hogs. Almost no cattle were killed and packed at Cincinnati, and the number packed at any other western towns besides Alton and Chicago were negligible. Probably if more explicit information were available it might be found that the progress of division of labor and of economizing in carrying, storing, etc., began nearly as early as did similar operations in the hog slaughtering business.

The following description of the killing of the beeves in

¹⁴ Cincinnati in 1851 (p. 228), description of Miller and Oldershaw's establishment.

1848 at Wadsworth, Dyer and Company's establishment in Chicago, shows the condition of the business at that time:¹⁵

We stood by while one animal was dispatched, which happened to be a fractious steer, with no notion of being killed any faster than he could help it. He utterly refused to hold his head still for the axe, being apparently possessed of the idea that the iron might be too hard for his skull. Consequently the axeman, though apparently skilled in his business, failed to strike correctly and it was several minutes before the poor beast could be got down, filling the room in the meantime with his roars of terror and pain.

It appears to us that the axe is an unfit instrument. The top of the head is such that unless the blow is fair, it only wounds and enrages the beast. Besides the handle is so short that the operator is obliged to stand so near the beast as to frighten him to evade the blow. Would not a heavy hammer, made like a sledge fitted to a long elastic handle, be a much better instrument? It would seem that it would be easier to direct it, at the same time that the operator would stand at such a distance as not to alarm the animal.

This suggestion seems to have been adopted, a hammer with a small head and long handle being used during the next year.¹⁶

After being killed and allowed to bleed, the animals were passed on to another room where the skinning and eviscerating was done. The carcass was then halved and hung up in the cooling room until it was in condition to be packed. In 1849 Wadsworth, Dyer and Company killed and dressed 220 cattle at their establishment in one day, which at that time was declared to be the largest day's work ever done in that line at any slaughtering house in the country. The entire number of men engaged in slaughtering, dressing, and packing the beef at this house was 75 to 100.

When it is realized that at the great plants of the larger packers at Chicago today, the capacity is 2,500 cattle and 15,000 hogs, and that 800 men each have some separate por-

¹⁵ *Prairie Farmer* (Nov., 1848), Vol. VIII, p. 337.

¹⁶ *Prairie Farmer* (Dec., 1850), Vol. X, p. 382.

tion of the work to do in the slaughtering and dressing of the cattle, and 182 have some part of the work to do during the 12 minutes which it takes for a hog to pass from the cutting to the cooling rooms, the operations of these early slaughterers and packers may seem somewhat paltry. Yet it was the experimenting in those early days that made possible the enormous expansion which followed the introduction of refrigeration.

Progress by Experiment

Almost every year where any specific data regarding the industry can be found, it is possible to note some progress. In 1850, for example, Wadsworth, Dyer and Company, found it necessary to install a steam engine to do large amounts of the pulling and lifting in their establishment, which was quite an innovation. This aided very greatly in the killing of the cattle and handling of their carcasses, the following account being given of the method:

A man with a huge rope noosed at one end enters a pen where stand half-a-dozen live cattle and he tosses the noose over the horns of a bullock. The other end of the rope is already passed through a ring in the floor and is attached to a wheel which is turned by the steam engine. As the rope tightens the bullock is bound to come out, and when his head is drawn sufficiently near the ring, a huge Boston axe of tomahawk shape is applied to his skull and he falls—killed by steam. His head and hide are jerked off. He is eviscerated, a gambrel thrust under his nether tendons, another rope over another wheel is wound by the same steam engine, and he is hoisted upon the beams and slid off to dry and cool. From the time he gets the ugly rope around his horns until in halves he hangs a mere beef, four minutes may elapse . . . so summary and relentless is the fate of cattle here.

Further illustration would but serve to emphasize the gradual improvement in the process of slaughtering, and would add little more than a mere list of the minute advances which season after season produced.

By-Product Material Thrown Away

Profitable utilization of the waste products is carried to such an extent today that the packers pay more for the live cattle and hogs than they receive for the dressed meat, the profit from the by-products often being more than enough to make up the difference. It is possible to trace the growth in the importance of these by-products throughout the whole period of the early packing industry.

As long as the slaughtering was done at an establishment which was conducted independently of the packing plants, the offal, head, internal organs, blood, hair, and other trimmings of the slaughtered animals were considered a part of the waste material which the slaughterer must dispose of. The packer did not want to be bothered with it, and for that matter, neither did the slaughterer. In fact, at Cincinnati all this material was dumped into the Ohio River, and since the current was swift enough to carry it away that proved to be an easy method of getting rid of it.¹⁷

At Chicago similar methods were tried, but the sluggish waters of the South Branch were not able to carry away their load, and the stench became so great that the city council forbade the packers the use of that river as the depository of this refuse. The material then had to be carried off to a distance sufficiently far from the city and there buried, this operation entailing considerable expense, the blood being the only refuse which could be discharged into the river. It was considered a great advance when the Chicago papers were able to state in 1850 that the offal from all the slaughter houses was being carted away to be used as a food for hogs, so that the only real waste was the blood. Thus, at this late day, the Chicago packers considered themselves fortunate if they did not have to pay someone in order to have the refuse from the slaughter houses destroyed.

¹⁷ Mackay, Charles, *Life and Liberty in America*, p. 128.

Early Saving of By-Products

At Cincinnati, on the other hand, and at the packing points in the southern part of Illinois, which had learned the business from the Cincinnati concerns, the utilization of by-products began at a much earlier day. The only payment made to Coleman, who operated the majority of the slaughter houses at Cincinnati, as early as 1837, was that he was allowed to have the fat and grease of the entrails and the bristles, this being valued at that time at about 50 cents per hog. Apparently the rest of the refuse was considered valueless.¹⁸ The Alton slaughter houses during the season, 1844-1845, were willing to pay 10 cents per head for the privilege of slaughtering, accompanied by the right to keep all the portions of the animal's anatomy which were not destined to go into the barrel.¹⁹ The Alton newspapers had a great deal of fun at the expense of the St. Louis slaughter houses, which were offering at this same time as a special inducement that slaughtering would be done free of charge.

At a period shortly before this in Chicago hogs were butchered anywhere in the city, the fat taken from the entrails, and the whole given to the owner, for 18 cents each.²⁰ During the forties the usual custom at Cincinnati was for the slaughterer to take the refuse as his payment for the slaughtering and dressing. In addition, he bore the cost of delivering the hogs to the packinghouses, but since every year enhanced the value of his perquisites, such as the fat surrounding the intestines, the heart, liver, etc., for food, and the hoofs, hair, etc., for manufacturing purposes, for the two years preceding 1850, from 10 to 25 cents per hog were paid as a bonus for the privilege of killing.²¹ When the slaughter houses had been finally absorbed by the packing establishments, the by-products continued to be used with increasing profit.

¹⁸ Lloyd, *op. cit.*

¹⁹ *Alton Telegraph*, Oct. 18, 1845.

²⁰ *Prairie Farmer* (Nov., 1841), Vol. I, p. 81.

²¹ *Cist*, Cincinnati in 1851, p. 278.

Lard a Chief By-Product

One of the most important of the by-products of the packing industry, namely, lard, was derived to a very slight degree from materials that would otherwise have been thrown away. In the early days it was simply a matter of preference on the part of the packer whether he packed all his pork, or whether he "tried out" a portion of it for lard. The ultimate decision rested upon the prices of the various products. In a year when the prices for lard ranged rather high, the packer preferred to devote more of the product to that commodity. If prices were not good for lard, he had his choice between curing his pork in bulk and pickling it in barrels.

The process of rendering lard was not infrequently undertaken by the packer, but this was by no means always the case. Even when the scraps of meat and the portions of the carcass of the hog not available for packing were melted at the packinghouse in order to separate the lard from the meat, the product was often sent to a special establishment to be refined, since the crude lard could not be sold readily. But the machinery necessary for the satisfactory refining of lard was too expensive for many packers who did their business on a small scale.

It gradually became more and more apparent that almost every portion of the hog's carcass could be utilized in the manufacture of lard. Only the best fatty portions were devoted to the manufacture of the high grades of lard for cooking purposes. For the poorer grades there were other uses. The manufacture of neatsfoot oil was one of the earliest uses to which inferior lard was put, and the manufacture of tallow candles was transferred at an early date from the farmer's fire-side to the factory. Indeed, at Pittsburgh, which preceded Cincinnati as the chief packing point in the country, as early as 1817, there were four tallow chandlers employing seven men and having an annual product valued at \$32,600.²² In that same year the town of Lexington, Kentucky, boasted four

²² Fearson, H. B., *Sketches of America*, pp. 203, 245.

candle and soap factories whose products were valued at \$12,150. One of the earliest industries undertaken at Alton was the manufacture of neatsfoot oil.

At Chicago, for the twenty years or more prior to 1857, one establishment which was conducted by Charles Cleaver took all or nearly all the tallow and lard from the various packinghouses and manufactured it into various marketable products.²³

Lard Oil and Stearin

Lard oil was discovered to be a valuable substitute for whale oil, and in 1842, or possibly shortly before that date, factories for the rendering of this product were erected at most of the cities where packing of any considerable amounts was carried on. In this year at Alton one purchaser of hogs devoted them entirely to the manufacture of this commodity, while a Chicago packer was packing no prime pork, but "trying out" all the pork of that grade for lard in preparation for the lard oil mill which was soon to be built.²⁴ Cincinnati, in 1849, boasted 30 lard oil manufacturers, among them the largest in the United States. During that year 11,000,000 pounds of lard were run into oil.²⁵ Lard oil was made by divesting the lard of one of its constituent parts, namely, stearin.

The claim was made for it that it was sure to displace whale oil for illuminating purposes, and that for lubricating purposes and for the use of manufacturers of woolen goods, lard oil was superior to any other known.²⁶ In addition to these uses it entered quite largely into the adulteration of olive oil and sperm oil, 60 or 70 per cent of these products being composed of the adulterant. The separation of the stearin was effected by means of alcohol, the amount obtained being 70 parts of oil to 30 of stearin. The cheapness of coal oil and

²³ Cleaver, *History of Chicago*, p. 109.

²⁴ *Chicago Democrat*, Dec. 14, 1842.

²⁵ *Hunt's Merchant's Magazine* (Nov., 1849), Vol. XXI, p. 577.

²⁶ *Prairie Farmer* (Jan., 1843), Vol. III, p. 2.

the beauty of its light made it so popular that in spite of the frightful accidents which occurred during the first years of its use, it had by 1870 almost completely supplanted lard oil and stearin for purposes of illumination.

Early Lard Rendering

The earliest method of rendering fats into lard consisted in the use of very large kettles, in which the scrappage and other fat was thrown. By 1845, or thereabouts, the employment of superheated steam and the utilization of large, closed, boiler-iron tanks, were adopted. By putting on a pressure of 80 to 100 pounds to the square inch, a whole tank of fats could be melted in a few hours, whereas the old process might take days. Several explosions occurred, due to some defect in the lard tanks during the years when they were of a largely experimental nature.²⁷ Gradually the business of rendering fats into lard was taken over by the packers. This change took place in Chicago between 1854 and 1857. In the latter year the last independent lard refiner, George Cleaver, went out of business.

The application of steam to the extraction of valuable products from the wastage of the pork and beef packing operations was extended still farther as soon as its feasibility was proved in the rendering of fats. In 1851, one firm at Cincinnati engaged in the business of putting up lard, and devoted the entire remaining carcass to the steam extracting tanks. The pressure, 70 pounds per square inch, was so great that the whole mass was reduced to the consistency of powder. The fat was then drawn off and the residue, a mere earthy substance, was taken away for fertilizer. This firm, and others of like nature, also utilized the great mass of heads, ribs, backbones, feet, and other trimmings from the various packing-houses. Even the offal was put in the extracting tanks and forced to yield up its quota of grease.

²⁷ *Alton Courier*, Jan. 13, 1854; Dec. 17, 1857; etc.

Soap and Glue Making

The inferior material gained in this way as well as the grease secured from the hogs which had died en route, or from pork which had spoiled through want of care, entered into soap manufacture, which soon came to be a very lucrative business. Much of the offal, as well as the hoofs, horns, and bones, were used in the manufacture of glue. This industry had attained importance in Cincinnati by 1850, though it does not seem to have been significant in Chicago until a later period. The proprietors of the first glue factory in Chicago, so it is said, did not purchase their materials from the packers, but went out on the prairie and dug up the materials the packers had buried there during the day. The packers did not acquire the control of the manufacture of glue until after the close of this early period, Armour and Company being the first to enter this field, by the purchase of Wahl Brothers' Glue Factory in 1885.²⁸ Not all of the large packers of the present day own their own glue factories, and so in this case the process of integration is not complete.

The waste materials of various sorts were very early used for fertilizing purposes, the residuum from the glue factories, from the extraction of lard and grease, as well as the blood and offal being turned to this use. The utilization of this material for commercial fertilizers, however, does not appear to have been adopted before the eighties, when the scarcity of Peruvian guano made the demand for fertilizer sufficient to cause a more scientific preparation of these materials for market.

Bristle Dressing and Chemicals

The business of bristle dressing was carried on by three different establishments at Cincinnati in 1847, giving employment during a part of the year to more than one hundred hands. The industry had grown very rapidly in importance since 1840, in which year twelve laborers were employed, the value of the

²⁸ Armour, J. Ogden, *The Packers, the Private Car Lines, and the People*, p. 196.

product being only \$16,000. The season's supply in 1847 was valued at \$35,000, and in 1851 at \$55,000. Bristles were also an article of export at Alton, St. Louis, and other western towns. The hair, as well as the bristles from hogs, was made a product of commercial importance also at a very early date. No data have been discovered which enable one to state just when this industry passed into the hands of the packers. The preparation of the bristles so that they can be used in the manufacture of brushes, etc., and of hair, so that mattress makers will purchase it, is now confined entirely to the packing plant.

By 1851, the packers of Cincinnati and other western towns were getting some profit from the extraction of prussiate of potash from the hair, hoofs, and offal. There is no definite statement as to whether this industry was separate from that of slaughtering and packing, or not, but the general method of conducting these businesses in early days leads to the belief that the extraction of chemicals from the wastage of the packing-houses began as an independent industry and became one of the processes carried on in the packinghouses only at a very much later date. The blood was also used at this time, or before, for the manufacture of prussian blue. These chemicals were used in New England print factories for coloring.²⁹

The gall from the beeves was saved at Chicago as early as 1848, and sold at 37½ cents per gallon, while the horns and hoofs of steers brought 10 cents a set.³⁰ At a somewhat later period the manufacture of glycerin and gelatin was designated as among the allied industries of beef packing.³¹

Cattle Hides Important

From the earliest days of the industry the hides of cattle were considered a very valuable by-product, and never seem to have been among the perquisites of the slaughterer. Tanneries were not connected with the packing establishments, and the

²⁹ Cist, Cincinnati in 1851, p. 285.

³⁰ *Prairie Farmer* (Nov., 1848), Vol. VIII, p. 336.

³¹ Transactions of the Illinois State Agricultural Society (1867-1869), Vol. VII, p. 162.

business of tanning hides is one of the few industries, dependent in a large measure upon the packing business, which has not become to a great degree an integral part of it.

Cooperage was, of course, indispensable to the early packers. On two different occasions in the first years of the business in Chicago, the non-arrival of the barrels which had been ordered necessitated the piling of the carcasses of the hogs on the banks of the river for several months until the opening of the navigation in the spring made it possible for the shiploads of barrels to reach the city. There is no record during the early history of the packing industry to show that the barrels were made in a plant which was owned by a packer, though at the present time the manufacture of barrels is but one department of the packing business.

Curing Hams by Non-Packers

The business of curing hams was often carried on by the packers, but this was by no means necessarily the case. A great many firms existed at the various towns and cities in the West which were engaged entirely in the business of curing hams. These firms either purchased directly from the packers or lard refiners that portion of the hog's carcass which they used in their business, or they obtained the whole carcass from the slaughterers or owners, and then sold that portion of the carcass which they could not use to the firms engaged in some other line of the pork business.

As time went on less and less was heard of independent firms devoted entirely to this business, and by the fifties, although many small firms remained in the ham-curing business, no large packing concern was considered complete unless it cured its own peculiar brand of hams. Hams were either smoked or sugar-cured. The former process was usually carried on in a smokehouse situated some distance from the remaining buildings of the plant, or in the packinghouse cellar, the location being determined by fire considerations.

CHAPTER VI

EARLY FINANCING OF THE PACKING INDUSTRY

Difficulties of Financing

The financing of the early packing industry presented peculiar difficulties, due to the fact that from one-half to four-fifths of the value of the finished product represented the value of the raw material.¹ The large sums of money necessary for the purchase of the cattle and hogs which the farmers had for sale, had to be paid out to the farmers in cash at the beginning of the packing season, from two to eight months before the packer could expect the products of his packinghouse to be sold in the distant southern and eastern markets.² The outlay for livestock was so considerable and such large sums were required at a day's notice that, wherever the business was conducted on anything like an extensive scale, the necessary supply for available credit or cash on hand had to be large. No other business in the West needed such large funds for the time it occupied. The power to command almost any amount of money desired is what gave Cincinnati her continued superiority over the Illinois, Kentucky, and Indiana towns, where natural conditions for meat packing appeared far more favorable than those of the Ohio metropolis.

The capital required to construct a packing plant was not large. Under the primitive conditions of the early days little machinery was used. Slaughtering was done out of doors or

¹ Cincinnati Miscellanies (Feb., 1846, Vol. II, p. 318) gives the proportion as 80 per cent. Charles Cist's "Cincinnati in 1851" (p. 286) gives 60 per cent as the correct proportion. The truth is that the fixed charges caused the variation in the price of raw material to be greater than that of the packed product.

² The case of the farmer who packed on his own account constitutes an exception to this statement. It will be discussed later.

at slaughtering houses, which were distinct from the packing-houses, and all the packer needed was a large covered room without any special facilities whatever. The construction and maintenance of a packinghouse was, however, the least of the packer's financial troubles.

First Packers Commission Merchants

The original packers in the West were merely commission merchants, dealers in almost every kind of commodity, who simply engaged in the business of packing meat products as a side line which would take up their attention and keep their warehouses in use during the winter seasons. They packed the pork and beef which the farmers brought them in barrels, being paid a small sum for their labor and gaining an additional revenue by selling the farmers the salt, the saltpeter, and the barrels, at a slight profit to themselves. They then superintended the shipping of the product to New Orleans or to New York "on account of the owners," and secured an additional commission for attending to this for their farmer and drover clientele.

This form of conducting the packing business was not suited to any very large operations, and was speedily discarded for one more in harmony with the importance which the industry rapidly assumed. It is important only from the fact that in the period covered it was this old form of conducting their business upon which the packers almost invariably had to rely as a last resort. Some farmers, drovers, and investors could always be found who were willing to risk their money in investments in pork, and the humble commissions which the packer received from these individuals tided him over the "hard times" and gave him a little capital to begin operations the next season.

When the packer's only business consisted in packing on commission for the owner, it is obvious that he would need no very great amount of capital. The building in which the business was conducted had already been constructed for another purpose, and the revenue which he received from it during the

summer would hardly justify the charging up of the cost of the building to the capital account of his packing business. But even if the packer had no structure which he used at other seasons of the year for other purposes, he was not obliged to expend any very large amount of money to provide a suitable building. Any sort would do, and if he could obtain no building at all, he might succeed very well in his packing operations without one. Indeed, at Peoria, Illinois, on one occasion, a new packing warehouse just after its completion was flooded by unusually high water for the fall of the year, followed by freezing weather which made it useless for packing purposes. Undaunted by this slight difficulty, the packer moved his appliances out onto the ice, where he did his whole season's packing. He was so successful, moreover, that out of the profits of that single season's operations he was able to pay entirely for the house which he had not been able to occupy. This does not represent the usual situation, however. Even at a very early day, the packers, whose chief business was doubtless conducted on a commission basis, advertised that they were also prepared to pay cash for the farmer's hogs and cattle. Few of these men had capital enough so that they could pay cash to the farmer for his stock and wait six months or more for their returns.

Western Packers and Eastern Capital

Almost from the very first, western packers came to depend on eastern capital for the funds necessary for their business. Whenever the western house was merely the branch of some large eastern concern, the question was not one which caused the packer any worry. In this case he would be little more than a manager of a small portion of the total business of the concern. Many packers were, however, independent. In order to accommodate such, and at the same time obtain good investment for their own capital, eastern bankers, produce dealers, and commission merchants were accustomed to scatter

their representatives throughout the West wherever packing operations of sufficient magnitude were being carried on, for the purpose of making advances on the pork which was being packed for shipment to the western markets. These men, whose representatives usually came West annually and remained only during the packing season, provided the packer with funds to pay the farmer cash for his stock. Thus, for example, at Alton in 1843, it is recorded that "the city was filled with persons who commanded foreign capital that was seeking investment in the single product of the country, at such prices as would insure a profitable return."

At times the aid of the banks was directly enlisted by the packers. Sometimes state banks aided in financing them, but this alliance of the state banks with the packers was exceptional, rather than general. Banks were, of course, always ready to discount bills for the packers, but these bills had to be drawn for such a short time that the packers could not take full advantage of them. Moreover, at the time when the packers most needed funds, the banks were compelled to make the hardest terms with them.³

Banks, Packers, and Speculation

The lesson of several unfortunate speculations in which banks were involved had a salutary effect upon the early meat packing industry. Some of the errors into which pork dealers had fallen during the periods of wild enthusiasm in the thirties and forties may be learned from a comment⁴ on the flour business in 1840, as contrasted with that of pork packing or of dealing in grain and provisions.⁵

³ *Alton Telegraph*, Nov. 16, 1839.

⁴ *Ibid.*, Aug. 24, 1839.

⁵ A distinction ought to be made in some cases between the packer who merely did the physical work of putting the cured flesh of hogs and beeves into barrels, and the "packer" as the individual who had purchased the hogs, paid for their slaughtering, curing, and packing, and who often risked his money by shipping the product to a distant market where he might expect to obtain a higher price. The "packer" in the second and broader sense, might and sometimes did, include the packer in the former and narrow sense, but the term also included many commission merchants and provision dealers, some drovers, large farmers, and stock raisers, and, in fact, any individual who invested his money in the business.

In this industry there is not, as in the case of corn and pork, any danger of overdoing. For the last five years great attention has been paid to corn and pork, as, indeed, there ought always to be, and we hope these articles will continue to bear a good price; but it is evident that the large overstock of pork in the Atlantic cities, laid in at high prices, and now selling at a great loss to the packer, will cause the price of pork hereafter to come down to the standard of other things. The fall of provisions, we doubt not, will produce one good result. It will cool the courage of those who have heretofore been so fierce in racing through the prairies, and have contributed to establish the foolish habit of contracting and receiving hogs in the gross and at the pens of the farmers.

The speculative element in early packing which led country banks in Middle West states to attempt to make large profits in it resulted sometimes, as, for example, at Alton, in an effort by these banks to "monopolize the pork, beef, lead, and grocery trade of the Mississippi." As a part of one scheme, the firm of Newberry and Dole of Chicago had been furnished funds to the extent of \$80,000 for a business carried on under their own name, although in reality they were merely packing on commission for the president and directors of the bank, and their friends, who were thus using the funds of the bank to contribute to their personal wealth. Similar investments made in several other cities totaled at least \$2,070,000. Such methods, as is well known, resulted in disastrous banking failures with consequent distress in the business.

During the years which followed the close of this chapter in the history of the financing of the packing industry, or from 1840 on, whenever speculation seemed imminent and there appeared to be the danger that the buyers of pork were paying more than eastern and southern markets would warrant, the old days were recalled, and the pork dealers were advised to make their calculations very carefully, since "they must recollect that there were no banks to break this year, to help them out of a bad scrape."⁶

⁶ *Alton Telegraph*, Dec. 3, 1842.

Aid of Banks to Cattle Feeders

Banks bore an important indirect relation to the packing industry as a whole, in their assistance to the "cattle feeders." Although this relates more directly to conditions in Ohio, as a type of the general relation of agricultural credit to the packing industry, it is worthy of mention. The banks of Chillicothe, Circleville, Columbus, and Xenia did more of this business than any others and found that it was the most profitable banking business of any in the state of Ohio. The cattle trader, ready to buy a drove of cattle to fatten, would apply to the bank for a loan. For this he gave a bill of exchange on New York or Philadelphia at four months, which the bank discounted, receiving the funds when the cattle were sold, thus getting both interest and exchange, which brought a profit of 10 or 12 per cent.

Nor was this the end of the transaction. The cattle dealer paid out the notes he had received from the bank, to the "grazer," who in turn gave them in payment for cattle purchased farther west. This was of additional value to the bank, since it kept its circulation well diffused. This same method might have been adopted by the packers, had not the long delays which often occurred in New York before a sale could be profitably effected, made it unwise as a general policy for them to give bills due in four months' time.

Packers were sometimes fortunate enough to sell the pork or beef they had barreled, before it left their own warehouses. In such cases they were certain to come out safely in the operation, and the buyer ran all the risk incurred in holding it for the eastern market. More often, however, the representatives of the eastern firms were authorized to do no more than make advances to the packer up to a certain amount on all pork consigned to the firm making the advances. Such sums, further, never amounted to the full value of the product, and in time of financial stringency when the packers were in the greatest need of generous help on the products, there was often

the greatest disparity between the amount actually paid and the value of the commodity. At such times it was customary for the packer to resort to the old expedient of packing the goods on a commission basis. A common advertisement was that "liberal advances would be made by the packers to their country customers and to others wishing to pack or ship to New Orleans or the East."⁷

Packers were by no means always residents of the town where they were engaged in the business of packing. Large produce dealers often had packinghouses located at several points. There their personal representatives might engage in the actual business of packing, or they might hire a local packer to put up the produce for them on commission. The different towns in the stock raising districts were only too glad to see any such investors coming their way.⁸ These dealers had abundant resources and the local packer was often very glad to escape the risk of loss after shipping his products to the eastern markets, preferring to pack on commission for large produce firms rather than to pack on his own account.

Burden of the Local Packers

From what has been stated already, it is clear that, after all, much of the burden of the financing of the packing industry fell upon the local packers. Packing was sometimes done by the representatives of the large produce firms of the cities, who had all the capital they needed for the purchase of the cattle and hogs brought to market by the farmers, but most commonly, the local packer had to work out his financial salvation by himself. If he was fairly sure of a speedy sale of his products he was able to get the necessary funds to provide his raw materials by discounting his bills at the banks. More often he was obliged to consign his product to some New Orleans, New York, or Boston produce and commission

⁷ *Alton Telegraph*, Nov. 18, 1843. Advertisement in this instance of W. Libby and Company.

⁸ *Alton Telegraph*, Sept. 9, 1843.

dealer, who, in turn, advanced him a portion of the future price of the commodity in that market.

This aided the packer to secure the necessary funds, but left him with all the risks which might result from fluctuations in prices. The eastern firms seldom advanced such a large portion of the total value of the product that a fall in prices, however great it might be, would result in any loss to them. On the other hand, the very fact that eastern dealers would not advance the whole of the capital necessary for the financing of the packing business, compelled the packers to operate with the needed sum on a wide margin. Thus, in good years, the packers were able to make vast profits, in comparison with the actual amount of capital which they had invested in their business; while a single bad season might easily wipe out of existence their entire original capital, together with all the profits of their previously successful years.

Almost every panic or financial stringency resulted in a cessation of the purchase of livestock from the farmers for cash and the devotion of the entire plant to "packing on account of the owners," whenever they were willing to risk the danger of loss due to the variations in the market. This resort to packing on commission during periods of depression, which is characteristic of the early phases of the industry, was due to two causes: Eastern capitalists had no specie which they wished to tie up in produce at these times, and western packers usually lost all they had, periodically with the recurrence of each successive panic.

A Complicated and Uncertain Industry

After this review of the actual financing of the packing industry, however, there still remains for consideration the special qualities of the industry which certain problems made such a complicated one. Few fields for investment manifested greater uncertainty and variability than that of the early packing industry. These undesirable characteristics were due to

conditions which have now passed away. Prior to the railway era, prices might vary a great deal at two nearby points. If prices did not suit the farmer or drover at one place, they merely drove the animals on to some other place, or, it may be, did not sell them at all, but held them over for the next year in the expectation of higher prices. The variation in prices at the different places, with the consequent diversion of the supply of livestock from its customary market to some other, made the amounts packed at the different points vary exceedingly from year to year. Thus, in 1839 Alton expected to pack 60,000 hogs, but such large numbers were diverted to the points along the Illinois River that only one-third the amount planned for was packed at the former place. Again, while 40,000 hogs from Kentucky crossed the river for market at Cincinnati in 1834-1835, the following season showed that only 5,000 hogs had been secured from that state.⁹

A further cause of uncertainty in the packing business was found in the difficulty which the packers experienced in trying to estimate in advance the number of cattle and hogs which would be marketed in a given season. The most common cause of losses to the packer was due to his anticipation that the supply would be smaller than it proved to be, and the consequent higher prices at the opening of the season than the actual supply would have warranted, had the packer been able to ascertain beforehand what the number marketed would be. No system of information regarding the condition and amount of the crop was provided until after 1844, when the enterprising editor of the *Cincinnati Price Current* prepared each year a table of statistics of the pork packing business of the preceding season; but even those valuable figures provided no forecast of the number of hogs which would be marketed during a given season, and so were of little direct assistance to the packers.

Although pork and beef packing was a business which

⁹ *Alton Telegraph*, Feb. 3, 1836.

embraced one of the most important staples of the West, and furnished one of the chief articles of export, it was stated that probably there was no kind of employment that was so indefinitely understood by those who were engaged in it, and none that had proved so ruinous. Apparently about every other year the packers lost money on their operations. Indeed, one observer stated in 1851 that "for the past ten years he had never known two consecutive seasons to pay operators well."

Early Packing Speculative

Citations of actual conditions during certain representative seasons show clearly the guess-work and speculation which entered so largely into the early financing of the pork and beef packing of the West. The speculation, moreover, was not confined to men whose business had for years given them the experience which would enable them to foresee what the demand for any specific article would probably be, and what prices could be reasonably paid on the basis of prospective demand. Instead, these speculators were largely men of small capital and of small experience in the devious ways of the eastern financiers, and it is not at all strange, therefore, that they were made to bear all the heaviest risks, although they were least capable of doing so.

At Chicago the business was almost from the first in the hands of men of larger experience and with better eastern connections, and in that city there were few complaints of the losses which were so common a feature of the business as it was conducted in the southern part of the state. As the railroads became extensive in the Middle West during the fifties and sixties of the nineteenth century, the prices of all markets were made practically the same, and knowledge concerning the supplies of livestock in every community, and, indeed, all over the country became common property. With the arrival of this condition of affairs the financing of the packing industry ceased to be a blind gambling proposition, and became a science.

This period also marks the entry into the business of the first firms whose names have later become the symbols of Chicago pork and beef packing. These firms soon acquired a large capital of their own, and no longer depended on the advances which the eastern produce dealers were willing to dole out to them. On the contrary, they soon reversed the old order of things so completely that they gave the eastern provision firms advances in the way of meat products for which these firms paid only after they had sold the goods.

CHAPTER VII

BUILDERS OF THE MODERN PACKING INDUSTRY

Pioneer Packers' Constructive Work

The modern meat packing industry has grown out of the crude kind of packing business described in the preceding chapters because of two forces, one mechanical, the other human. Both did much to reduce the element of speculation in the early primitive stage and to improve its technique. Gradually in the Middle West the financing of the industry was put upon a solid basis, as has been shown at the close of the last chapter. By the time of the Civil War, railroads were knitting the country together, stabilizing livestock and meat markets and preparing a ground-work on which the other force in the development of the industry might build the complicated business of today.

This other force, the human element, was composed of several men who are numbered among the great constructive business minds that the United States has produced. They were men who were given an opportunity and were able to acquire a large experience and to benefit by it. Many of them had connections in consuming centers which enabled them to develop national organizations in both the production and the distribution of meats and meat products. In the years immediately preceding and following the Civil War there arose several of the meat packing companies whose names are considered the most representative in the American meat packing industry of the present time.

Since economic development is not only the result of mechanical forces, but also the work of men who have directed

the mechanical elements themselves, there is profit in sketching at this point the significant features of the lives of several of the builders of the modern packing industry. In doing so, representatives have been chosen who may be considered as typical of many other pioneers whose names do not appear, since this book deals in the main with the meat industry as an economic growth rather than with the biographies of individual packers.

While it is not possible to treat of these representative builders of the packing industry in strictly chronological order, it may be said that one of the very first of those men who founded one of the great modern firms was Jacob Dold. The Jacob Dold Packing Company, one of the more widely known meat packing companies in the United States, was a pioneer firm which has had a continuous development, with constantly growing traditions, unlike many of the earlier firms whose names have not been preserved.

Jacob Dold's Success

Its founder, Jacob Dold, was born in Wurtemberg, Germany, where his family had been for generations in the meat business. At 10 years of age he helped his father in slaughtering and in sausage making, afterwards becoming apprenticed to the largest butcher in his native town. At 16 he was given the duties of stock buying and at 22 had mastered the details of abattoir management.

In 1848 young Dold came to the United States and settled in Buffalo, where for three years he worked at his trade as a butcher. Then he began in business for himself with his savings. At first he made sausages in small quantities and peddled them from house to house. His trade soon increased to such an extent that he was obliged to buy a horse. In 1852 he sent for his father, mother, brothers, and sisters—six in number—and shortly after they came he built his first slaughter house, which had a capacity of ten hogs a day. By energy,

enterprise, and economy he acquired an extensive trade. His sausages became well known. In 1860 he had to enlarge his plant, and so put up a three-story brick building, combining a meat market, dwelling rooms, and abattoir. With the Civil War the food resources of the North were taxed to support the needs of the army. Dold received government contracts which gave his business its first real impetus, and from that time on his progress was phenomenal.

Cordukes, Sinclair, and Kingan

Another noted pioneer in the meat packing industry came from Ireland, long famous for its hams and bacon, where he had built up the greatest business of that kind. Its meat curing establishments date back several generations. Early in the fifties, Cordukes, of the firm of Gilmore and Cordukes, a leading pork packing establishment in Belfast, conceived the idea that "the hog had a future." He made a trip to Denmark and to Hamburg in Germany, but not being satisfied with the situation in those countries, he decided to try "the States." So he came to America and brought with him to Cincinnati some of his most skilled workmen. The chief business of many packers at that time was not slaughtering, but cutting hogs into Cumberland long ribs, long and short cut hams, and various other cuts. Cordukes' firm in Belfast had been catering for years to the English trade, and he was able to ship an article which pleased the English market. The Cincinnati industry received a great impetus as a result. The example of Cordukes was followed by several other pioneer firms, such as W. P. Sinclair and Kingan and Reid.

The career of Samuel Kingan, also of Belfast, is particularly interesting, because he founded a firm which is today large and flourishing. He, with his two brothers, came to Cincinnati in 1852 and built a pork packing establishment. Later they removed their headquarters, as did some others, to Indianapolis. Soon they had plants and houses throughout

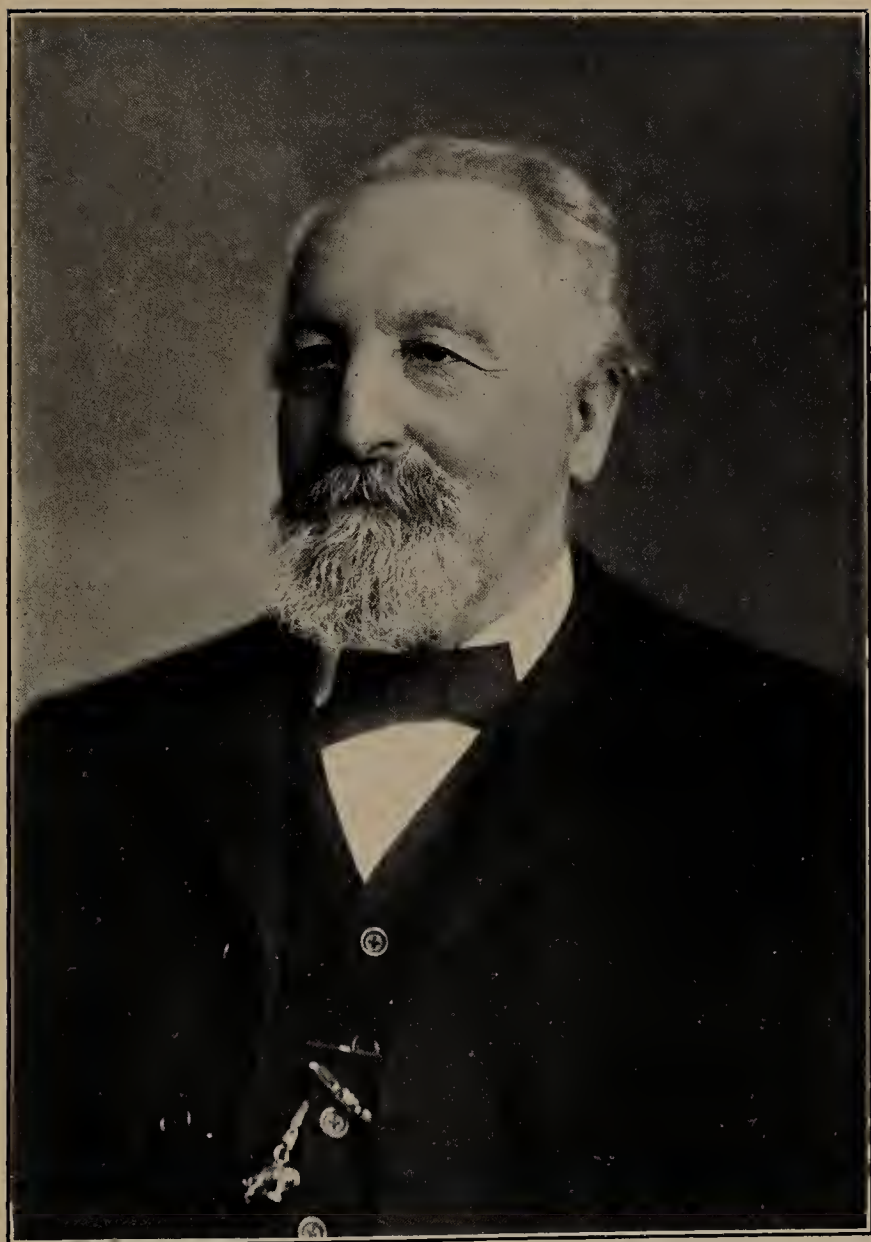


Figure 3. Jacob Dold

the United States and Great Britain. Samuel Kingan himself remained in the United States for about sixteen years, when he returned to Belfast and directed the affairs of the whole business from that point.

John Plankinton's Influence

Still another packing enterprise which has become widely known throughout the United States began at this time. John Plankinton came from Pittsburgh, Pennsylvania, to Milwaukee, Wisconsin, on September 8, 1844. Plankinton's object in going to Milwaukee was to enter the butcher business with George Metcalf, whom he had previously known. This plan, however, was frustrated by the fact that Metcalf had entered into another partnership, which compelled Plankinton to launch out for himself.

Accordingly, he leased some ground at a rental of \$60 per annum, erected a small frame building, at a cost of \$100, and opened a meat market with a capital of \$450. Such was his success that his first year's sales amounted to nearly \$12,000.

Here he remained until 1849, growing in wealth and experience, when, the country having been well stocked with cattle and hogs, he commenced a slaughtering and meat packing business. This he continued for one year, when a partnership was formed with Frederick Layton, under the firm name of Layton and Plankinton. The slaughtering was principally confined to cattle, as the hogs were mostly killed by the farmers themselves at that time. In 1860, the partnership was dissolved, Layton retiring and the business being conducted by Plankinton alone until 1863, when there were but three establishments of its kind in the United States whose business was larger.

Philip D. Armour

By this time it was patent to Plankinton that the business he was engaged in would soon be the leading enterprise of the

West, wheat alone excepted, and he was seized with a desire to develop it further. In order to effect this, a new partnership was entered into with Philip D. Armour, then a rising young man, under the firm name of Plankinton and Armour, and under this name the firm soon began to make its power felt.

The name of Philip D. Armour has since become widely known, not only in the packing industry in the United States, but in the commercial world generally, from Europe to Australia, as that of one of the greatest modern merchants. He was born on a farm near Stockbridge, New York, on May 16, 1832, of Scotch-Irish Presbyterian stock.

He was a natural leader of his schoolmates. In his twentieth year he joined a party going to California gold fields, he starting on foot, with \$100 in cash, in the company of three other men. The journey took six months. One of the party died and two turned back, leaving only the 20-year-old boy to achieve the goal.

With too fixed a purpose to yield to the temptations of a merely adventurous life, Armour on his arrival in California wisely decided, to use the phrase of Elbert Hubbard, "that he would not bet on anything but his own ability." Therefore, he did not dig for gold himself, but set to work to dig ditches for men who had mines but lacked water. Armour's plan lacked glamor or excitement, but was solid. At first he was paid \$5 a day, later he took contracts for ditches and soon had a number of men working for him. In five years of steady work he saved \$8,000. With this sum he made his way back to New York.

The story goes that on the journey east he began to be interested in the possibilities of the livestock and grain of the western country for feeding the populous areas of the East. At any rate, the California experience broadened his views and strengthened his character. It turned his thought to the chance of making his fortune as a merchant.



Figure 4. Philip Danforth Armour

Armour's Start in Milwaukee

On his way back from California he had journeyed along the Great Lakes and had spent a short time at Milwaukee. This city, in those days, was a growing place as the gateway of the West and the natural market where vessels loaded for the East. The one rival of Milwaukee was Chicago, some 85 miles to the south. Chicago, however, though at the head of lake navigation, was on low, flat, marshy ground, and it was conceded that Milwaukee would be the great future port.

After a long visit at his old home in Stockbridge, accordingly, Armour went to Milwaukee. His first venture was in the grain, produce, and commission business in March, 1859, in partnership with Frederick B. Miles. Each man put in \$500 and the business prospered beyond their hopes, supplying produce and meats to the multitudes that streamed into Milwaukee, westward bound.

This partnership was dissolved in 1863, not because of any decline in business, which was very prosperous, but because at that time John Plankinton invited Armour to become his junior partner under the firm name of Plankinton and Armour. Armour and Plankinton continued as business associates with great success for many years. Plankinton had been long a resident of Milwaukee. He had a thriving business, he stood high as a merchant, and he commanded general respect as a public-spirited citizen. Uniting in business with such a man was a fine opportunity for the exercise of Armour's powers of organization.

Extension of Plankinton and Armour

Having means, as well as credit and brains, Plankinton and Armour at once took the initiative in the slaughtering and packing of beef and pork, increasing their facilities yearly, as their business increased, until their Milwaukee establishment alone covered 9 acres of ground, and had a capacity for handling from 5,000 to 7,000 hogs daily, their average being

30,000 per week when in full operation. In addition to this plant they built a branch in Chicago of even larger size, and one at Kansas City, for cattle slaughtering alone, in which from 40,000 to 60,000 head were slaughtered annually. In all three establishments their business for 1880 exceeded \$12,000,000.

Armour developed even more successfully on the merchandising side. During the Civil War and after, his careful attention to the causes of changes in the price of provisions made a fortune for the business. Its war contracts for pork products were very large. The end of the war found it in a strong position and well stocked with large orders for mess pork, sold for future delivery at wartime prices. These contracts the firm filled at a much lower cost, with a very satisfactory financial reward.

In the meantime the city of Chicago was growing faster than Milwaukee, aided by the rich country to the south and west. As time went on it became clear to young Armour that Chicago was destined to be the metropolis of the Middle West. It was already a better market than Milwaukee for pickled beef and corned beef; more boats were fitted out in Chicago and more emigrants were passing through on their way to take up government land. Even before Armour had joined Plankinton, he had, together with his brothers, Herman O. and Joseph F. Armour, established a grain commission business in Chicago, and by 1856 he was convinced that his best interests would be served by establishing a meat packing plant there also.

Armour and Company at Chicago

The Union Stock Yards in Chicago had begun operations in 1865, and two years later, Armour and Company began packing hogs under that firm name. At first hog packing was the exclusive business of the firm, but in 1868, Armour and Company began killing cattle, and two years later, sheep were slaughtered. New markets were developed under Armour's

direction in all parts of the country, in order to take care of the trade which was so rapidly growing with the increase in population and with the betterment of facilities for handling meat and meat products. Armour played a large part in the development of those facilities. His work in furthering the perfection of refrigeration, both natural and artificial, was particularly noteworthy and is responsible for a great deal of the prosperity which the packing industry has had, and which has, in turn, been reflected in agriculture.

With these years there came a country-wide branching out of the Armour interests, a development which was greatly aided by the fact that P. D. Armour had the co-operation of several able brothers.

Although Herman O. Armour had established himself in the grain commission business at Chicago in 1862, he was induced by Philip to surrender this to a younger brother, Joseph F., in 1865, and to take charge of a new firm in New York, then organized under the name of Armour, Plankinton and Company. The organization of the New York house was timely and successful. The financial condition of the West at that period did not permit of the large lines of credit necessary for the conduct of a business assuming such magnitude. It was, therefore, fortunate that the duties devolving on the head of this house should come to one eminently qualified to handle them. H. O. Armour thus became the eastern financial agent of all the company's western houses.

A Family of Able Merchants

The firm name of H. O. Armour and Company at Chicago remained unchanged until 1870. The firm continued to handle grain and pack hogs, the latter part of the business being conducted under the firm name of Armour and Company. In 1870 Armour and Company took over all the Chicago operations. The business of all these houses grew to dimensions considered phenomenal by the trade, and their brands became

well known in all the markets of the world. In all these developments in the industry Philip D. Armour was the dominant spirit.

It became evident to Armour in 1871 that the livestock producing power of the country was rapidly migrating westward, and in order to keep abreast of it he established at Kansas City the firm known as Plankinton and Armour, under the immediate supervision of an elder brother, Simeon B. Armour. The total output of the Chicago, Milwaukee, and Kansas City houses under the vigorous leadership of the three brothers was enormous. The failing health of Joseph at Chicago necessitated assistance. Consequently Philip moved to Chicago in 1875, where he resided until his death in January, 1901, and where the further great expansion of Armour and Company during the next two decades took place under the direction of his son J. Ogden Armour.

In 1879 Armour induced another brother, Andrew Watson Armour, the last one to leave the old homestead at Stockbridge, to remove to Kansas City to take charge of the Armour Brothers' Bank. This change led afterwards to the admission into the Kansas City packinghouse of the sons of this brother, Kirkland B. Armour and Charles W. Armour, who became the active managers there. Large plants were later established at Omaha, Sioux City, East St. Louis, St. Joseph, and Fort Worth. Joseph Armour died in January, 1881, A. W. Armour in May, 1892, and S. B. Armour in March, 1899. In August, 1901, H. O. Armour died, and in September of the same year Kirkland B. Armour. His sons, Watson and Laurence, have since entered the business and taken part in the Chicago management. Later Philip D. Armour, III, the grandson of the founder of the house, also entered the management, and is now vice-president, working directly with President F. Edson White, who became president of the company on the retirement of J. Ogden Armour from that office.



Figure 5. J. Ogden Armour

Armour By-Products and Beef

As a manufacturer, P. D. Armour was constantly seeking greater economy and efficiency, by preventing waste. It was found that many articles that previously were either removed at expense, given away, or sold for trifling amounts, could, by good handling or by mixture with other suitable raw materials obtained for the purpose, be made into glue, curled hair, ammonia, and above all into fertilizers, which have almost revolutionized agriculture. As a merchant Armour was quick to see and utilize new outlets for all his products by furnishing them to consumers at the lowest possible prices, with guarantee of excellence.

In the years just previous to 1881 a new method was developed for handling beef for the eastern markets. After a number of years of experimentation cattle which had formerly been slaughtered and dressed at their destination were killed at western points, and the dressed product shipped successfully in refrigerator cars to eastern dealers. This required a large outlay of capital and could be successfully carried out only by doing a large volume of business. On the other hand, the new method reduced to a minimum the cost of handling. The house of Armour and Company became one of the leaders in this trade.

P. D. Armour's capacity for work was exceptional. He was at his desk by six o'clock in the morning or earlier. Fatigue was an unknown experience to him. He traveled extensively, but in the interest always of a wider intelligence. He could then be found usually among those who consumed his products, and where his agencies had been established or new ones created. He was a close observer, with a strong faith in the future. He thus formed clear and accurate forecasts of financial conditions in a growing country. He acted upon them promptly and decisively. His foresight in estimating the agricultural products of the country, in both supply and demand—notably provisions and grain—was remarkable.

P. D. Armour inspired respect and affection among his friends and business associates to an unusual degree. Particularly among those connected with the interests which he controlled, loyalty to him and to his wishes was pre-eminent. It inevitably was a large element in his progress. He could always count upon the co-operation of his men.

Rise of Nelson Morris

About the same year, 1859, that P. D. Armour began in the grain business at Milwaukee, a man who was to be one of his chief rivals in the packing business, built the first packinghouse near the present Union Stock Yards, in Chicago, and established a meat packing business. This was Nelson Morris, founder of Morris and Company, who started in a very small way, handling all details of buying and selling. He knew from actual experience the principles of marketing livestock. After the establishment of his first cattle slaughtering plant, he continued almost exclusively in this line until 1879, when he erected one for hog killing and began buying hogs regularly on a large scale. From his first little slaughtering establishment there developed by the time of his death in 1907 a plant at Chicago which covered 30 acres and included 40 buildings, with a daily capacity of 5,000 cattle, 1,000 calves, 10,000 hogs, and 10,000 sheep. There were, in addition, plants in several other cities doing a business of over \$100,000,000 a year.

Nelson Morris was born on January 7, 1840, in Hechingen, Germany, in the heart of the Black Forest. His parents, people of means and standing, had met with misfortune and became exiles as a result of the German revolutionary movement of 1848. At the age of 11 Nelson Morris landed in Philadelphia, without a friend and without a dollar. He walked to New York and got his first job as a charcoal hauler at Lakeville, Connecticut, at \$5 per month and board. Later he worked his way on a canal boat to Buffalo, changed there



Figure 6. Nelson Morris

to a lake schooner, and went to Michigan City, Indiana. From that point he walked to Chicago.

At Chicago his first work was caring for livestock at the old Myrick stockyards at 29th Street and Cottage Grove Avenue, which has already been mentioned and which were then owned by John B. Sherman. It is said that the very day Sherman gave him a job Morris had decided to work his way back East, thinking there was nothing for him in Chicago, but before he had worked for Sherman a month he had caught a glimpse of his future. He soon began to buy cattle and hogs and started in the cattle business. He had many reverses to overcome, but he persevered to ultimate success.

Morris and the Cattle Trade

The first large venture of Nelson Morris in the meat packing business was when he was 22, in the early days of the Civil War. He also began shipping cattle to the East by rail, and started what was later to be the greatest cattle exporting business in the world. His first great success was the obtaining of a contract from the federal government to supply the Union Army with cattle and beef. One contract called for 20,000 head of cattle for the eastern armies, and he had also a contract to supply all the beef for the army in the West. His success in filling these contracts was the foundation of his future rapid progress.

With regard to the export cattle trade, Nelson Morris stated in 1885 in a letter in response to a government inquiry into the development of the cattle business, that he was the first exporter of live cattle from the United States to Europe. He pointed out that he had exported a few cattle to London and Glasgow in 1868, but that there were many difficulties connected with this trade in its early stages, although by 1885 the mortality averaged less than 1 per cent.

Indeed, Nelson Morris, besides being a packer and an exporter of live cattle, was a great cattleman and was known

as such all over the world. His ranch and cattle interests were proportionate to his packinghouse investments. He was interested in many livestock enterprises and did much good work in breeding. At the end of his life he, himself, owned one ranch of 300,000 acres in Texas, one of 30,000 acres in Indiana, and one of 30,000 acres in Nebraska. He was the greatest feeder of distillery cattle in the world and a pioneer in this particular branch of the livestock business.

These two men, Armour and Morris, were the first of the large packers to begin operations in Chicago. Keen competitors' rivalry gave them added zest and played no small part in the future development of their companies. A story given currency by Elbert Hubbard in his entertaining little sketch of Philip Armour in the series "Little Journeys to the Homes of Great Business Men," throws an interesting light on the relations of Armour and Morris.

Armour and Morris Competitors

Two peculiarities of P. D. Armour were that he refused to own more land than he could use, and that his only stimulant was tea. Tea seemed to stir his mind to greater activity. With so much personality and magnetism Armour had few important competitors, but one of the few was Morris, and Armour was unable at times to understand the able Bavarian Jew.

Morris in his early years bought hogs in the yards at 4 A. M., or as soon as it was light. Armour himself was early, but he found as a rule that Morris was ahead of him. Morris was by very energetic methods giving Armour a stiff run, and the situation perplexed the latter. He decided to take active steps to get ahead of his competitor. As a result it happened that one morning at daylight Morris when he arrived at the stockyards, found all the pens empty, for Armour had been going around with his hog buyers all night hunting up the owners and bulling the market. Morris said nothing, but the

next week trainloads of hogs were being shipped to Chicago, consigned to Nelson Morris. He had sent his own agents out into the country and was buying from the producers direct.

Soon after this incident Armour casually met Morris and suggested that they lunch together. Morris agreed and so they did. Morris ate very little. Both men talked, but said nothing. They were waiting. Although Morris ate little, he drank three cups of tea. Armour insisted on paying the check, excused himself somewhat abruptly, and hurried to his office. He sent for his lieutenants. They came quickly and Armour said, "Boys, I've just lunched with Nelson Morris. I think we'd better come to an understanding with him as to a few little things we shall do and a few we shall not do—he drinks nothing but tea." But the competition waxed instead of waned as years went on, until in 1923 Armour and Company bought the physical assets of Morris and Company.

G. F. Swift's Early Life

Another man who came from the East to build a great meat packing business in Chicago was Gustavus Franklin Swift. He was of English stock, eighth in descent from William and Elizabeth Swift, who came to Boston in 1630 from the county of Essex, England. The Swifts settled finally on Cape Cod in the oldest township, Sandwich, near Plymouth. They were leaders in the life of the community of farmers and increased in numbers, until, as Freeman in his history of Cape Cod writes, "the Swifts were like the stars for multitude." It was in West Sandwich or Sagamore, that G. F. Swift was born on June 24, 1839, the ninth child and fifth son among twelve children of William Swift, a farmer.

Very early the boy gave evidence of a genius for business. At 14 years he struck out for himself, becoming apprentice to the local butcher for seven years at \$1 a week, but he was too energetic to stay long as an apprentice, and at the end of four years he bought the remaining time with his note for \$1,000.

His next venture was in killing and selling meat in the village, at which he soon acquired a reputation for neatness. This work was interspersed with trips to Brighton Market near Boston with pigs and cattle. In 1859-1860, with his brother Nathaniel he went to Easton, a little town nearby, and opened a butcher shop. Here in 1861 he married, and shortly after, to leave the local field open to his brother, he moved to Sagamore, where he opened a butcher shop and slaughter house and where his son, Louis F. Swift, now president of Swift and Company, was born. Another brother was a butcher in Sagamore, and the generosity of G. F. Swift again showed itself through his removal of his own business to Barnstable.

A Successful Cattle Dealer

The position of a local butcher in a town of less than 1,000 people did not content Swift. While studying how he could better himself he considered the difficulty the farmers on Cape Cod had in marketing their cattle. Soon he was buying and selling cattle. In a short time this became his real business and he was no longer a village butcher, but a cattle dealer.

The story is told in Charles Winan's "Evolution of a Vast Industry" that G. F. Swift's first business venture was when his father loaned him \$20 with which he bought a heifer, which he killed and dressed himself. He peddled the meat around Barnstable and made a profit of \$10.

To carry on his cattle business, Swift moved next to Lancaster, some 40 miles northwest of Boston. By this time he was buying cattle all over New England and taking them to Brighton stockyards. In 1872 he entered into partnership with Henry Hathaway, who had had a local dressed meat business in Boston, under the firm name of Hathaway and Swift. Swift was in charge of the buying end of the business and extended his operations to Albany and to Buffalo to tap the ever-increasing supply of western cattle from the ranges.

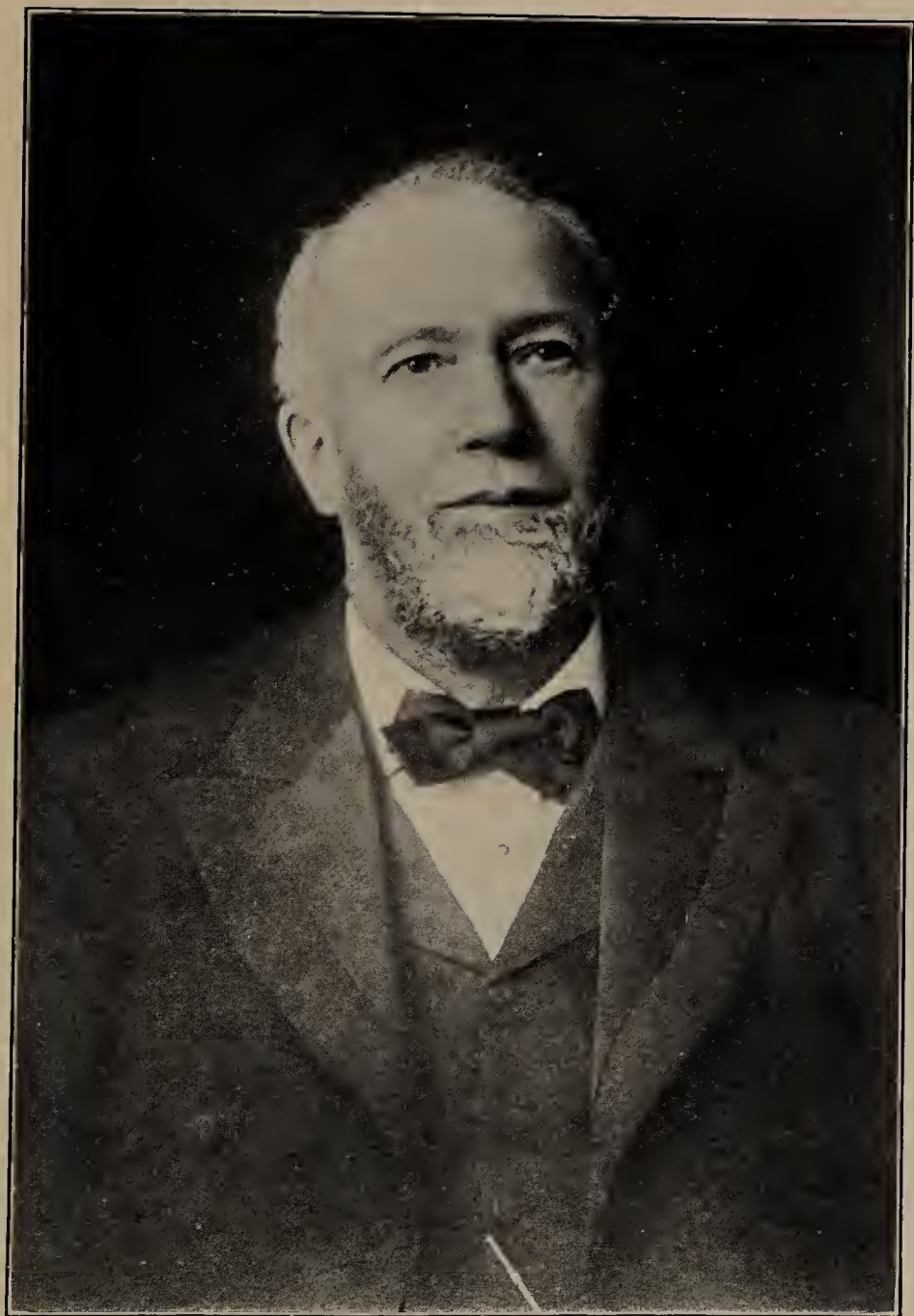


Figure 7. Gustavus Franklin Swift

While living in Albany and Buffalo, Swift was apparently studying carefully the whole matter of livestock marketing. He must have decided that Chicago, already the most important livestock market in the country, was to become more and more the center of the American cattle business. He saw that to be a leader in the cattle business he must locate in Chicago. He therefore proposed to his partner, Hathaway, that the cattle buying be transferred to that city. His partner was skeptical, but in 1875 Swift went to Chicago as a cattle buyer in the Union Stock Yards.

Swift Becomes a Packer

Swift did not begin as a packer, but he soon saw that cattle buying was only an incident to the meat business and it was not long before he purchased "Billy" Moore's slaughter house in Chicago and began a packing business. By an interesting coincidence, this was in the same year as P. D. Armour moved his permanent residence to Chicago from Milwaukee. Armour was 43 years of age, seven years older than Swift. He was rich and had had packing interests in Chicago for several years. The sole advantage Swift had was youth.

The new business Swift developed was the preparation of dressed beef at Chicago and the sending of it to eastern markets, which inaugurated a new or modern era in the packing industry and made possible its development on the great scale of the present time. This story of the rise of the dressed beef trade, one of the most dramatic in commercial history, is treated in a later chapter. The great growth of the dressed beef business, with the resulting by-product industries, was due to the refrigerator car. While Swift did not invent this car and was not the first to use it, he was one of the greatest factors in making it a commercial success.

Regarding this work of G. F. Swift in initiating the dressed beef trade on a national scale, Charles Edward Russell in a

series of articles in *Everybody's Magazine*, in 1905, remarks as follows :

As soon as it was discovered that Mr. Swift was right, a great revolution passed over the meat and cattle industries and eventually over the whole business of supplying the public with perishable food products. The other packing houses at the stockyards went into the dressed beef trade, refrigerator cars ran in every direction, shipments of cattle on the hoof declined, the great economy of the new process brought saving to the customer and profit to the producer, and the new order began to work vast and unforeseen changes in the life and customs of the nation.

Hard Work and Slow Growth

The early years were years of slow growth. As Louis F. Swift, present head of Swift and Company, has said :

I can remember when my father bought all the cattle we handled and he did not need any help. Then came the time when he had to go to the packinghouse and offices, and I took up the buying and did all of it. My five brothers followed me. I well remember when we were able to ship one whole car of beef in one day. It marked an epoch in our business.

In these first years many prophesied Swift's failure, and it was a constant struggle for several years. Yet each year found him with an increased business. In 1885 the firm was incorporated as Swift and Company, with a capital of \$300,000. From that time on the increase was rapid, and in 1887 the capital was raised to \$3,000,000. Today it is \$150,000,000.

This progress was made possible by extraordinary financial ability and daily overtime toil. As his biographer, Dr. Goodspeed, has said :

He was matched against some of the ablest business men of his day, or for that matter, of any day, all of whom were struggling for supremacy in what was a new industry in the world of business. They drove each other to well-nigh superhuman efforts to carry their products around the globe. The out-



Figure 8. Louis F. Swift

standing illustration of this is the successive establishment of branch plants. The first branch of Swift & Co., was established in 1888 in Kansas City, Mo. Two years later the Omaha branch followed. In 1892 another was built at St. Louis. Then followed St. Joseph, Mo., in 1896-97; St. Paul in 1897 and Fort Worth, Texas, in 1902.

These were all fully equipped packing plants, each of which developed into a great business, but they were in every case opened only after the most thorough and exhaustive examination, in several instances carried on by G. F. Swift personally.

An Organizing Genius

In meeting the demands of a constantly expanding business G. F. Swift's financial and inventive genius was taxed to the utmost. At every stage he grew in his power to borrow large sums of money, to improve the equipment of his plants, to find new markets for his products, and to increase the efficiency of an ever larger business organization. G. F. Swift was a great administrator. For he had a mind that was both microscopic and telescopic. He kept in touch with details such as the color of the paint on his wagons. In his letters to his representatives he was always explicit and usually closed with these words: "Please answer and say you have carried out these instructions."

The real reason for Swift's success lay in his personality. This has been summed up by his biographer as follows:

His talk was that of any ordinary man of business, but his face took me wholly by surprise. It was not the face of a typical business man, but that of a scholar, or a poet, or an artist. It looked like the face of a man who might see visions and dream dreams. And his fundamental characteristic as a man of affairs was his business imagination. From his youth up he was always seeing possibilities that other men could not see. He was like an explorer in a new country. Every step in advance opened up new vistas. Every new achievement gave him a vision of something bigger beyond. He was a man of business vision. But his visions were not of the "baseless fabric" sort.

His idealism was of the most severely practical kind. His business imagination never played him false. It might soar among the clouds but his Cape Cod conservatism kept his feet firmly on the ground and he walked with sure steps to his high achievements.

Michael Cudahy's Work

In the days when Swift and Armour were developing their great companies, still another was directing the production operations for Armour and Company at the Chicago stockyards, who was later to found what is today one of the five largest packing companies in the United States. This man was Michael Cudahy. He was, like some of the older pioneer packers, Kingan and Cordukes, an Irishman. Born in Callan County, Kilkenny, Ireland, in 1841, he came to America with his parents in 1849 and made his home in Milwaukee. It was there he got his first experience in the packinghouse industry. When 14 years old he entered the employ of Layton and Plankinton in Milwaukee, and later worked for another packer, Edward Roddis, until 1866, when the business was closed out. In 1866, he became private meat inspector for Layton and Company, and three years later became superintendent in charge of the packinghouse of Plankinton and Armour at Milwaukee. The whole plant at that time was worth only about \$35,000. Cudahy's ability was such that in a few years P. D. Armour offered him a partnership in the firm of Armour and Company, in Chicago. Cudahy took charge of the stockyards part of the business. Years afterwards, in 1890, he withdrew and with his brother, Edward A. Cudahy, formed The Cudahy Packing Company.

While in Milwaukee Michael Cudahy showed his initiative in introducing new processes and methods. Among them was his introduction of the summer packing term by storing ice in cribs and bringing about a low temperature which made practically winter conditions for packing meats.

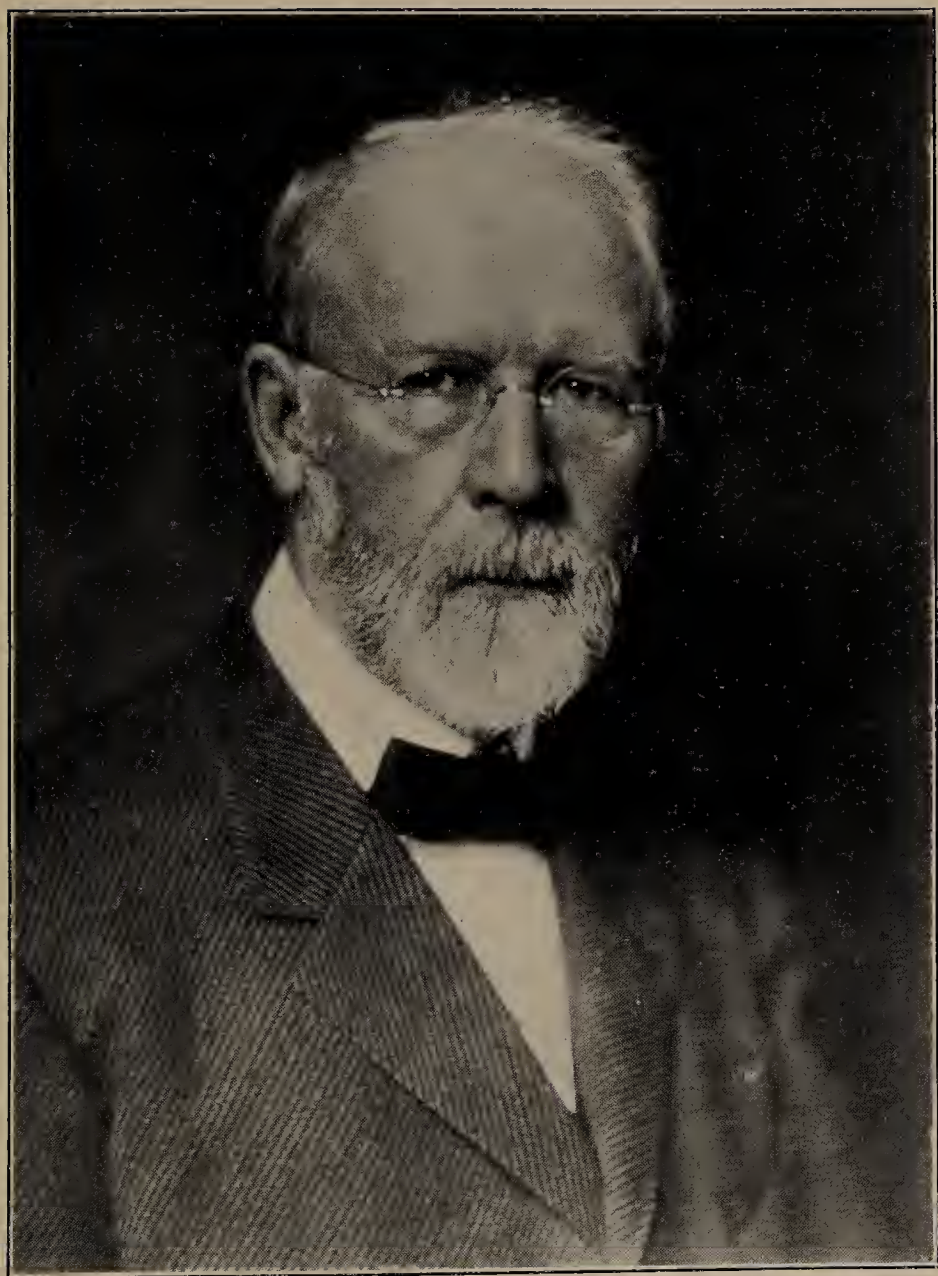


Figure 9. Michael Cudahy

The Cudahys Go to Omaha

The Cudahy Packing Company began business in 1887 under the name of the Armour-Cudahy Packing Company, when Michael Cudahy, Edward A. Cudahy, and Philip D. Armour, of Chicago, purchased a small packing plant in South Omaha, Nebraska. In 1890, Michael Cudahy sold his interests in the firm of Armour and Company and purchased the interests of Mr. Armour in the Armour-Cudahy Packing Company, the name of which was subsequently changed to The Cudahy Packing Company.

Michael and Edward A. Cudahy went to Omaha at a moment which could not have been better chosen for their own fortune and the development of the packing industry. There were in Omaha in 1887 only two small packers, whose business was for the most part confined to packing for the British market, but this was not the best outlet for the rapidly increasing supply of livestock which was really better adapted to the domestic market. This was more especially true of hogs. The Cudahy brothers very shrewdly saw the opportunity to be developed in packing for the domestic market. In this course they were amply justified, and were later able to develop a foreign outlet on a large scale as well.

Within thirty years the business and property of the company have grown from a single plant, employing 700 operatives, with an annual pay-roll of \$300,000, to 8 plants, with a floor area of 110 acres and cold storage floor area of 25 acres, with a slaughtering, curing, and preparing capacity for 15,000 hogs, 4,000 cattle, and 10,000 sheep per day, employing about 9,000 men, with an annual pay-roll in excess of \$10,000,000.

Present Heads of Large Packing Companies

The packers whose lives have been sketched thus far have all passed on their great industries to others of their family. It is not the purpose to dwell here on the achievements of the present heads of these organizations, except to say that they

have in some cases exceeded the abilities of their predecessors and in other instances have been able to build far beyond the aim of the first generation. J. C. Dold, J. Ogden Armour, Louis F. Swift, Edward A. Cudahy, Nelson and Edward Morris, and others have done much for the further development of the packing industry of the country.

Thomas E. Wilson

Outside this group of pioneer builders stands a man who illustrates, however, certain new developments in the industry, namely, Thomas E. Wilson, president of Wilson and Company and formerly president of Morris and Company. The story of his rise shows the development of qualities of a born administrator similar to those of the older generation of Swift and Armour and Morris.

Thomas E. Wilson was born in London, Ontario, on July 22, 1868, of Scotch-Irish extraction. His father had accumulated a moderate fortune in drilling oil wells and running a refinery. When the boy was 9 years of age the family moved to Chicago. After passing through the primary and high schools of Chicago young Wilson found himself unable to go to college, since his father had met with financial reverses, so he had to look for a job. The job he got after a long hunt was a minor clerkship in the head office of the Chicago, Burlington and Quincy Railroad at \$40 a month. There were other places to be had and some at higher wages, but as young Wilson expressed it, he wanted to get himself identified in some way with a big concern like a railroad so that when he got to the top it would be worth all the trouble of making the climb.

One day in 1887 the chief clerk of the Burlington was asked by Nelson Morris and Company to send them a young man to keep the records of their refrigerator cars. He picked his chief assistant as the man he felt was best qualified for the job. After an hour's visit to the stockyards the assistant returned to the Burlington office, announcing that if he were

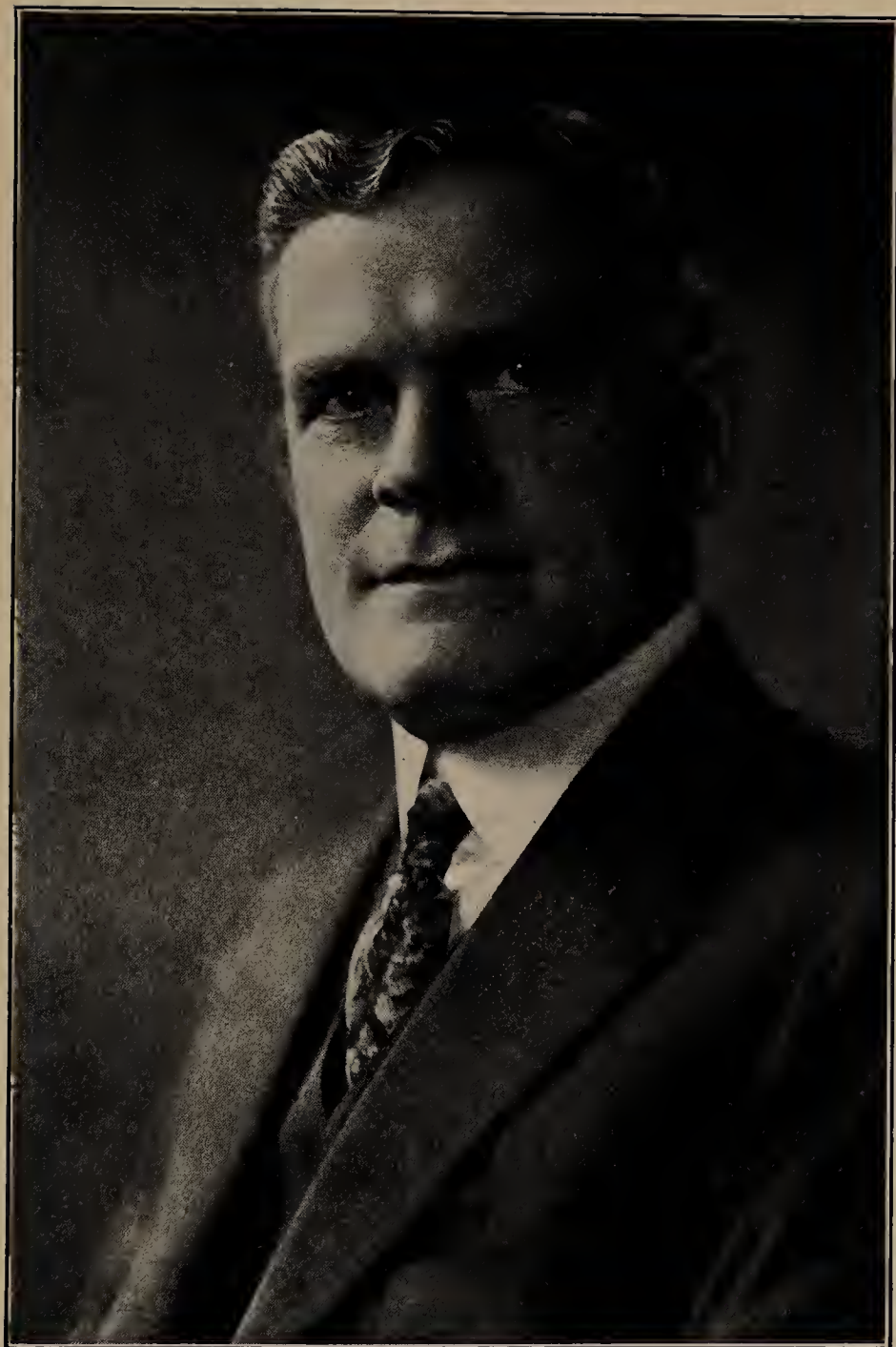


Figure 10. Thomas E. Wilson

offered the whole stockyards he would not go there to work. The salary of \$100 a month, however, which had been mentioned, struck young Wilson as being a desirable thing to get. So the 19-year-old youth asked if he might go out and look over the possibilities. He received permission and went.

Wilson Starts With Morris

In a recent interview with B. C. Forbes, Mr. Wilson described his first trip to the stockyards as follows:

I found that conditions at the stockyards were not exactly salubrious. . . . Everything was crude and rough and uninviting—quite different from the sanitary conditions of today.

But there was no lack of business. It looked as if a fellow could find a lot to do. I thought I could see an opportunity for anyone willing to work and to stay by the proposition. The prospects appealed to me and so I accepted the job.

Wilson's first work was making records of the railroad mileage of both refrigerator and stock cars. This was necessary, since the railroads paid the packers for the use of the cars; but he did not spend all his time in the office. Soon he was putting in a good deal of it in the yards, taking an interest in the actual handling of the cars and becoming familiar with the car repairs. As a result he was placed in charge of all car repair work.

When the company began building its own cars, Wilson was given the management of this development. In a short time he trained another man to take his place as manager of car construction, and he, himself, took over the headship of the purchasing department for the whole plant, which entailed buying supplies of all kinds, machinery, and construction material.

Building Branch Houses

This phase of the company's activities involved also the necessity of travel in order to supervise construction of the

growing branches of Morris and Company. As time went on Wilson added to his duties the task of locating new branch houses and selecting men to run them. For example, one whole winter he spent in New England with Boston as his headquarters, and as a result he covered that territory with branches.

He would go to a town and investigate to see what Armour, Swift, Hammond, and other packers were doing, and if he thought the place would stand another branch, he would buy or rent property. He would then outline to the drafting department the kind of layout wanted and get a rough plan, which he revised and embodied in a final plan with specifications. With three or four construction men Wilson would supervise the special work of putting the branch into operating trim. Finally he chose a local manager.

Following this experience in construction Wilson was given the management of the company's general construction work. Soon all the superintendents were put under Wilson who supervised both the manufacturing and the construction work. The company was growing and when Frank Vogel, who was the "and Company" of Nelson Morris and Company, retired from the business, Edward Morris, the eldest son of Nelson, took Thomas E. Wilson, who was then 32, into his office. In 1906 Wilson became vice-president and finally on the death of Edward Morris in 1913 he became president.

He did not remain long at the head of Morris and Company, however, for it had been the desire of Edward Morris, who had ably maintained the organization his father founded, that his sons, Nelson and Edward, should be trained to run the business. This Mr. Wilson felt was right, and he himself had an ambition not to remain an employee all his life.

A Leader in His Industry

In 1916 Mr. Wilson's ambition was realized. During the preceding autumn, some New York bankers made him an offer

to take charge of one of the best-known packing companies in the country which had its headquarters in the East—Sulzberger and Sons Company. Ferdinand Sulzberger, who had done much to build up the organization and was a very able packing-house executive, had been inactive for several years, and died in 1913. The business had been carried on by his two sons and they had made an arrangement for refinancing the company by certain New York banking interests. These interests, having got control, wished to have the property built up and developed in the best way, and they came to Wilson.

Though their first offers were declined by Mr. Wilson, he was finally induced to accept, by being given a very substantial interest in the business with a large salary. As a result the name of the company was changed to Wilson and Company. Mr. Wilson soon built up a very efficient organization and at the same time began to develop a closer co-operation among the meat packers of the United States through the Institute of American Meat Packers, as well as between the livestock producers and packers. This brought him to a commanding position of leadership in the entire industry and made him a public figure in the life of the nation. He exemplifies, indeed, a capacity to translate visions into realities that was characteristic of the earlier builders of this industry. A later generation of packers has paid tribute to these builders, stout-hearted and clear-eyed, who toiled as men must toil who would create, who changed disorder into order, and placed the packing industry where it stands now, as an eliminator of carelessness and waste and a servant of the human race.

PART II

THE REFRIGERATION PERIOD

CHAPTER VIII

THE WESTERN RANGE CATTLE INDUSTRY

New Beef Supply in West

About 1870 was the beginning of the second era in the history of meat packing. One might say that not until then was it struck by the forces of industrial revolution. These were working both on the production and distribution sides of the industry during the decade 1870-1880. The result is the meat packing industry in its modern form as we know it today.

It is a source of continual interest how, just at the time a new need arises, a new source of supply usually comes to hand. That is what happened regarding the raw material of this industry. Up to this time packing had been mostly associated with pork products and was a local business in the main. From 1870 it became also in large measure a beef business and national in its scheme of distribution, changing entirely the meat industry of America.

During the five-year period following the Civil War, several significant factors combined to revolutionize the beef cattle business in the United States. Rapid increase in population and the development of manufacturing industries in the East and North had brought about a new demand and a larger outlet for beef. At the same time, as has been noted, railroad extension throughout the Middle West made possible the establishment of central livestock markets, which became accessible to beef cattle producers at long distances.

But for the meat industry to develop there had to be a new supply of livestock. That was found in Texas and the great Southwest. It cannot be said, however, that there was already

an organized range stock business in Texas, which had merely to be extended more widely to result in the cattle range industry. Livestock raising until the Civil War was simply intended to meet local needs of beef and mutton and wool. As the animals killed supplied the wants of the mass of the people for hides, pelts, and tallow, the only other outlet was in export to Europe.

Other outlets were later developed even before the Civil War. At the time of the California gold rush the markets of San Francisco and the various settlements proved a source of encouragement. About the same time James Foster began shipping prime beef steers to New Orleans from Texas ports by steamer. He was a pioneer in shipping cattle by seagoing steamships, and is said to have almost monopolized the output of Texas high-grade steers before the Civil War.

Pre-Civil War Cattle Driving

In 1850 a few Texas cattle were sold in New York,¹ but it was not until 1856 that a definite movement was begun to reach northern markets by driving. Several large herds were trailed into Missouri to St. Louis. This movement was getting well under way when it was interrupted by the Civil War. In the few years before the war railroad development had greatly aided this pre-Civil War cattle driving. For example, in 1857, the Ohio and Mississippi Railroad was extended from Cincinnati to St. Louis. Here it connected with the Missouri Pacific, which was then under construction from St. Louis to Kansas City. Although this latter road was started soon after 1850, it was not finished until 1865. At the same time the completion of the Hannibal and St. Joseph between the Mississippi and Missouri rivers, established railroad service between Kansas City and Chicago.

¹*The Prairie Farmer* (1885), Vol. XV, pp. 1, 248. They were brought by a Mr. Taylor of Missouri to a Mr. Ranklin of Illinois, who after feeding them brought them to New York by railroad. "They are very peculiar in appearance, having remarkably long horns and looking as though made for the great journey they have performed. The flesh is tough but fine grained and with somewhat of a wild flavor."

The Civil War made great changes in the livestock situation in America. The United States Department of Agriculture's yearly report for 1865 stated that there had been a loss since 1860 in everything except sheep. The great loss had been in the southern states, but, on the other hand, there had been a steady increase in the stock of the Pacific states. The decrease amounted to 7 per cent in cattle and 22 per cent in hogs.

This situation, together with continued wartime prices, induced Texas drovers to revive the movement in Texas cattle northward.² The fact that in New York City at the close of the war some 4,940,000 cattle were killed annually, is an index of steadily increasing demand for meat animals.³ Cattle driving soon became a regular business, and between 1865 and 1880 a total of 4,223,500 cattle, or a yearly average of 281,566, were driven north. Texas, with its constantly increasing supply of livestock, was able to meet the demand for cattle. Its climate was less severe than regions farther north, and although a confederate state, it had not been a base of military movements, and, having been blockaded, had no markets during the war except New Orleans and Mobile, which markets were controlled by the Morgan line of steamships. There had been nothing to retard its growth as a source of livestock. So it was that Texas became known as "pre-eminently the cow country."

However, the Texas supply was not sufficient. Other sources had to be developed, and so as a natural result came the rise of the range cattle industry on the great plains of the West which is, according to Professor Thompson, "the most important and far reaching fact concerning the history of stock raising in the United States after the Civil War."

² An example of the prices of cattle at that time is given by J. G. McCoy in "Sketches of the Cattle Trade" (1874), where the average of 1,200 cost \$4.50 per head, or nearly 40 cents per hundred pounds gross weight. An idea of the inflated prices of beef can be had from these figures: beef 8 cents per lb. for 600 lbs., $\frac{2}{5}$ of a 1,000-lb. beef being allowed for hides and tallow.

³ H. Exec. Doc. 39, Cong. 1 Sess., Vol. 15, No. 107, p. 301.

Rise of the Cow Country

Indeed, it was remarkable that this vast area of the great West should be so providentially adapted for stock raising, where millions of cattle could be raised until they were ready for the cornfields of the Middle West to be fattened for market. This region of the great cattle ranges occupied the flanks and valleys of the Rockies and stretched eastward across the plains into western Dakota. It was really made up of three divisions: (1) the Rockies, (2) the Continental Basin, and (3) the Pacific Coast. This wide expanse where the bison used to roam, became the great range and cattle country between 1870 and 1885, and was known after 1870 as "the cow country."

Its success for this purpose was due to three facts: first, the dryness of the climate, which caused the snow to be blown off of the slopes of the hills so as to expose the dried grass; second, the broken nature of the country, affording shelter in "coulees" and ravines to the animals during severe storms, and lessening the violence of the north wind; and third, the admirable qualities of the bunch grass which covered the ranges.⁴

The origin of the cow country was connected closely with four events, the first of which was the Oregon movement; second, the Mormon settlement of Utah; third, the discovery of rich metal deposits in Colorado, Montana, and generally, in the Rocky Mountain region, where mining camps presented a good local meat market; and lastly, the discovery that the apparently arid western plains and valleys possessed in their dried grasses a good cattle food. As a consequence of these four events the ranchers from Texas, in the late sixties, began to drive cattle northward and stock the ranges.

Indeed, the effect of these events, together with better marketing facilities which have been described in a former chapter, and a wide difference in the market price of cattle in

⁴ Nimmo Report, p. 73, Appendix No. 1.

the North and in the South, opened a profitable outlet for the southwestern herds.

Cattle Trails to the East

Thus by 1870 three principal routes to eastern markets had developed. One way led by coastwise steamer to New Orleans, whence the cattle were taken north in river boats. At Cairo, Illinois, the railroad journey was begun north to Chicago, thence to the East. A second route from Texas was over a trail to shipping points on the Red River, from which places the cattle were forwarded on steamboats to Cairo, then to be shipped north by rail. A third route followed the trails from Texas to feeding grounds along the railroads in Kansas and in regions farther north. From stations along these railroads the livestock were forwarded to eastern markets.

In order to reach these northern points in Kansas three or four cattle trails were used, which have since become famous in song and story. When the drives were resumed after the Civil War most of the herds followed the old routes of the preceding decade towards southwestern Missouri. The more favored of these, which led north by east through the eastern part of Indian Territory and Baxter Springs in the southeastern corner of Kansas, was known as the "Baxter Springs Trail." Later it became known as the "Old Shawnee Trail."⁵

After a cattle market and shipping facilities had been established at Abilene, Kansas, in 1867, a route through the Indian Territory further to the west came into prominence. This was the Shawnee Trail. Other trails were broken as a result of the railroad construction in eastern and southern Kansas. Only a few had distinctive names. One of these was the Chisholm Trail through the western part of what is now Oklahoma into Kansas, and was named after John Chisholm of Paris, Texas. It was some 6,000 miles long and 200 to 400 yards wide. Most of the Chisholm Trail comprised the Panhandle Trail to

⁵ Love, Clara, *Southwestern Historical Quarterly* (July, 1916), Vol. XX, No. 1.

western Kansas and Colorado, which was much used until a railroad was built northwest from Fort Worth through the Panhandle into Colorado in the late eighties. Still further west was another noted cattle way—the Pecos Trail. Its course was up the Pecos River Valley in New Mexico and on north to Colorado. Two of the trails to Colorado were later called the “Goodnight” and “Dawson” trails, after noted cattlemen.

Golden Age of the Cattle Trail

The decade of 1869–1879 was the golden age of the cattle trail. About 4,000,000 cattle were driven north in those ten years. They came with great regularity during the seventies except in the years 1874 and 1875, when the effect of the financial panic diminished their number.

For several years after the cattle driving began, however, there was a prejudice in the eastern markets against Texas beef. This was partly due to stories of the effect of Texas fever among cattle, and partly to undefined fears that the meat was otherwise unwholesome. In some markets the prejudice was so great that Texas beef was almost unsalable at any price, while that of local origin ranged high. Indeed, many people were afraid to eat Texas beef, and considered its presence on the blocks of their butchers an offense which should be forbidden by law. Of course, this kept down the prices of Texas beef grades taken north.⁶

Texas Longhorn Steers

The Texas steer, indeed, was not a prepossessing animal as compared with eastern farm cattle. The body had an emphasized lankiness and was set on long lanky legs. The

⁶ Smiley, Jerome, *Prose and Poetry of the Livestock Industry*, p. 438. An illustration is this: A shipment of beef cattle made from Kansas to the East in 1867, consisting of a round lot of about 900 head that had been bought there at something like \$20 per head, finding no market at Chicago, was forwarded to Albany, New York, where it sold for \$300 less than the freight charges alone, leaving the original cost of about \$17,500 for the lot a dead loss and requiring the shipper to throw the \$300 more into the hole.

head was elongated, and in many of the animals the long narrow face had a sinister and sullen expression. The wide-spreading curved horns, unlike those of almost every long-horned variety of cattle, generally had a horizontal trend, and it was not uncommon for them to have a spread of 5 feet from tip to tip. These cattle had become known by different names in different parts of Texas, such as "Dogies" in the East, "Sea Lions" along the Gulf Coast, and "long-horn" elsewhere. "Texas steer," however, was a name that was familiar everywhere. One merit this stock had was that it was well adapted to the period in which cattle were put on the trail in Texas, and driven day after day to northern markets and northern ranges. When this period came to an end and shipments were made by rail, these cattle were displaced, for the horns were a great inconvenience. An excited steer in a car might cause great damage, and but few could be put in one car. Yet no great change in the general character of the mass of Texas range cattle was apparent until late in the eighties.

The range cattle industry had a period of ups and downs in the early seventies, and it was not until about the time that the meat packing industry began to demand great supplies of cattle to can and to dress for eastern and foreign markets that it became settled and prosperous. These new features and methods in the packing industry, which are to be considered more in detail in a later chapter, brought a revolution in the meat industry of the world.

Rail Rate Wars Aided Cattle Trade

From 1867 to 1873 there had been a demand for Texas cattle which had brought out a large supply. Big profits were made. One reason for this great rush of cattle to the markets in 1870 was the fierce "freight war" that broke out between the trunk line railroads from Chicago to the Atlantic seaboard and that also affected rates from Chicago west. In the competition for business, rates went down until the freight charge

on a carload of cattle to Buffalo, to Albany, or to New York, sank to the nominal price of \$1. It was said that when the freight reached that point, some of the roads took entire trains of cattle through to New York free of all freight charges, and some shippers afterwards asserted that in the scramble to keep up a show of business and to demonstrate to rivals they were not weakening, certain roads actually paid a bonus for the privilege of hauling cattle to New York. One of the practical effects of this state of affairs was to transfer the seaboard market prices of cattle to Chicago, and in turn, those that would have been under normal conditions Chicago prices were shifted west into the Missouri River region.

Transferring Texas Cattle to Ranges

This situation in itself had a very remarkable and beneficial effect on future supplies and methods of cattle production. For the Texas cattlemen noted that, due to the large corn crop in the corn-growing states, there was an active demand for cattle for feeding purposes, and, therefore, most of the grades of southern stock which would under former conditions have gone to the northern ranges, were taken by the corn farmers. It was also felt that the demand for Texas stock from the northern ranchmen was nearing its end with the natural increase on the ranges, and for the future the Texas cattlemen would have to drive their surplus immature cattle to ranges in the North, and "fatten" them there on their own accounts. This marked the beginning of the great business of transferring Texas cattle to northern ranges and there rounding them out for market.

The financial panic of 1873 and the depression that followed hit the cattle industry of the West very hard. Enormous losses were sustained, for many cattle had been held for higher prices. Most of the cattlemen were in debt to banks, their cattle being pledged as security, but many banks went to the wall, and those that did not called the loans as they came

due. Cattle were sent east greatly reduced in price. This was the case also with Texas stock. In order to dispose of the cattle, thousands were killed for their hides, horns, hoofs, and tallow. Several rendering establishments were set up in Texas, the most important one being located at Fulton. This continued until values of rough cattle rose to about what the rendering establishments could afford to pay. Since then there has been no slaughtering of range cattle as a business simply for the by-products.

Recovery after Panic of 1873

From this condition of depression the stock raising industry began slowly to recover in 1876, owing to the operation of three factors. These factors were:

1. The gradual recuperation of the South, which gave the planter a surplus which he spent in buying the beef and pork products of the North as before the war.
2. Great development of dairying, cheese, and butter manufacturing, which created a new demand for milch cows.
3. The industrial and commercial recovery of the country, which revived purchasing of meat by the masses.
4. Rise of the range cattle business of the great plains to huge proportions and the growth of stock feeding in Kansas, Nebraska, Iowa, and Illinois, which brought into being stockyards in the West.

Having reached the heyday of the open cattle range, it is well to consider the economic relations of that institution, about which there has been thrown great glamor and which has been the subject of much literary romance. For further discussion of its methods and management the reader must be referred to special works on the subject.⁷

⁷ The most convenient source of information regarding the ranges and livestock production on them is in the following: Barnes, Will C., *Western Grazing Grounds and Forest Ranges*; and Barnes, Will C., and Jardine, J. T., *Livestock Production in the Eleven Far Western Range States*, Part II of *Meat Situation in the United States*, p. 1110 (1916). A good deal of the information in this chapter was gained from "old timers" who were very kind in imparting it. For a narrative full of color, see Hough, Emerson, *Story of the Cowboy*.

History of the Open Range

In brief, the history of the open range business in the West has had three periods. First came the boom days, between 1877 and 1886, and then the time of reaction up to 1890 which was followed by a readjustment of the business on common sense methods. In this chapter we trace conditions to the end of the first period, to show how it made possible the revolution in the meat packing industry in the seventies.

In the early days the pioneer cattleman entered a virgin district and claimed everything within sight. When a second appeared with his stock, the two would divide the district, and each keep on his side of the division line agreed upon. As others came in, the district was further divided, until it was considered by the stockmen to be fully occupied. With this appropriation of the country, and the practice of arbitrarily defining the boundaries of the ranges, there developed the theory of "range rights"—that is, a man's right to his range in consequence of priority of occupation and continuous possession, although none asserted actual ownership of the range land. These stockmen had liberal ideas as to when a district was fully occupied, however, and when range or ranch buildings were nearer than 15 to 30 miles from each other, the country was becoming, to their minds, crowded.

A Typical Range

The ranch headquarters were located as near the center of the range as convenient. The chief consideration was nearness of surface water, and so the buildings were often out in the open. The typical headquarters of a "ranch outfit" was a "double cabin," built of logs, where the men messed and slept. Near this ranch house was a corral and a small pound, or chute, for handling the cattle ready for market. Not much was spent on this side of the range life.

For the cattle were the main interest of the stockmen and cowboys on both the range districts—the southern or breeding



Figure 11. Watering Cattle on a Western Range

range, including Texas, Oklahoma, Arizona, New Mexico, and the southern half of Colorado, and the northern, or finishing range, sometimes called the "steer" range, which included the rest of the Rocky Mountain states. In the early years Shorthorns, then called Durhams, were the predominating breed. The Texas cattle brought north were bred up mainly by the use of Shorthorn bulls. The Devon was also raised to some extent, being taken west by the Mormons. Later, as the Shorthorns failed in stamina to withstand the winter and drought, the Herefords made their appearance, and because of their great rustling ability and their early maturing qualities, they became the breed cattle on the open ranges.

It is not possible to describe at length the life of the stockmen and cowboys, but it is well to try to catch the spirit of their lives.⁸ People in eastern cities have had an idea that it was monotonous, but it was nevertheless a life of activity and had exhilaration for a great army of cowboys, some 100,000 strong, in the days when the open range was at its height. The exhilaration was due in part to a "trinity of evils"—contending with blizzard, drought, and the stampede. Many of these experiences became the theme of verse, and recently Professor John A. Lomax has brought some of them together in an anthology entitled "Songs of the Cattle Trail and Cow Camp," celebrating a tradition typically American and preserving for the future these distinctively romantic songs. Here again one may see the cowboy at work and at play: hear the jingle of his big bell spurs, the swish of his rope, the creaking of his saddle gear, the thud of thousands of hoofs on the long trail winding from Texas to Montana.

The Round-up

One operation of the range remains to be considered here. This was the "round-up," a harvesting of cattle, a great

⁸ Some of this life is described in Roosevelt's "Ranch Life and the Hunting Trail," and in Emerson Hough's "Story of the Cowboy."

gathering, a sorting out and branding of beasts, young and old, that were without marks of ownership. The round-up and the driving of cattle on the trail were the two great spectacles of the range cattle industry in the seventies and eighties. There were two round-ups each year, apart from the usual work of the stockmen in looking after their cattle. One came in the spring, the other in the fall. They covered areas of 4,000 or 5,000 square miles. It was for the purpose of gathering together all the cattle and their enumeration, identification, and redistribution. State and territorial associations of stockmen divided the entire range country into districts, and the cattlemen of each district adopted a co-operative system to round up their cattle, under the leadership of an elected captain of the round-up. The method was to take the ranges successively and to give each cowboy a certain section to clean up.

By the time the drive was finished, some 2,000 to 4,000 cattle have been thrown into one herd at the chosen place . . . a dusty, milling, confused and bawling mass of excited beasts. Rebellious steers are shaking their heads and making threatening demonstrations with their horns; the half grown are trying to hide themselves by pushing their way toward the center of the horde; mother cows are distracted by their separation from their offspring; and bleating calves are trying to make themselves heard by their mothers in the uproar. The cowboys ride 'round and 'round the mass, driving back the more enterprising beasts determined to escape from the situation so disturbing to their peace of mind. But the disorder and confusion were not really as great as they appeared to be. The men were doing their work systematically in keeping the cattle together and in quieting them in preparation for the next stage of the proceedings.⁹

Branding Cattle

Then came the branding. If the calves were to be branded, they were first cut out by the men very quietly. After this the steers, cows, and strays were taken out. The cows and their

⁹ Smiley, p. 614.

calves were then driven to some corral, if one were available, or rounded up on the prairie, a fire built and when the irons were hot, the calves were roped and dragged to the fire. There two men grabbed them, one at the neck, the other at the feet, while others ran up with sharp knives to mark the ears and hot irons to burn the brand into the sides of the animals.¹⁰ In earlier years the brands were letters or some symbol, but later they became complex. One of the more striking was made of the initials of a San Antonio stockman—H. E. L. L.

The Great Cattle Companies

The latter part of this first period of the range history is known as the "great cattle boom of the early eighties." This has been well described by John Clay, the noted Chicago stockman, who was active on the ranges at that time.¹¹ After the industry recovered from the depression in the seventies, it was put on a more highly organized business basis. This was the day of the great cattle companies, many of which were promoted by English and Scotch capital. They were mostly floated in Scotland, and it is remarkable how freely the cautious Scotch investors loaded up with the securities of this character. The reports written on properties were couched in the most sanguine language. The newspapers were enthusiastic and paper profits looked enticing. It was one pyramid upon another. If the cattle had been actually counted and then carefully managed, it would be conservative to say that the average delivery of the various herds turned over would amount to about two-thirds of the book count. Here is a list of a dozen companies. There were others, but the following represent the larger companies:

The Prairie Cattle Company.

The Swan Land and Cattle Company.

The Texas Land and Cattle Company.

The Matador Land and Cattle Company.

¹⁰ For a selection of brands, see Barnes, pp. 186-189.

¹¹ Clay, John, *My Life on the Range* (Unpublished).

The Hansford Land and Cattle Company.
The Arkansas Valley Land and Cattle Company.
The American Pastoral.
The Powder River Cattle Company.
The Western Land and Cattle Company.
The Cattle Ranch and Land Company.
The Western Ranches.
The Espuela Land and Cattle Company.

In the year 1883 these cattle companies were flourishing. In 1887 every one passed its dividend, and today, after less than 40 years, only two of them remain—the Swan and the Matador. These companies had in round numbers debentures and reference shares of nearly \$10,000,000 and a share capital of \$12,500,000. How much has been returned it is impossible to tell. The loss, when interest and compound interest is computed, has been enormous. Only two of them, the Matador and the Western Ranches, have made a respectable showing.

Flotation of Cattle Companies

This great boom was set going by the high prices of cattle. In 1878 and 1879 the prices of ordinary stock cattle for range herds had been from \$7 to \$8 per head. Values in 1880 were around \$9.50. Throughout 1881 the prices rose and reached \$12. This great increase was due to several causes. The country generally was prosperous, and market demands for beef were ever widening. The packing industry had by its new methods increased greatly. The movement that began among the stockmen of the southern half of the cattle country in 1880 to increase the size of their herds, had in 1881 extended into the northern range districts and was demanding outside stock to add to the range herds.

This boom attracted many inexperienced people as well as others. Many young men from Britain and the eastern United States were simply in search of adventure and they proved a hindrance to constructive growth. There were, however, men who began at that time, who were in later days of great impor-

tance in the cattle and beef industry. One of these was Conrad Kohrs. Another was Henry Miller of Miller and Lux, a nervous little German, who was a pioneer in the meat packing business on the Pacific Coast. He had many of the characteristics of Nelson Morris, including a gift for selecting men and for organization.

The boom meant an overstocking of the range, which was unwarranted, and when the crisis of 1884 and the ensuing depression came, the mushroom industry went to pieces. Prices sank lower and lower during 1885, and by 1886 the crash ruined many cattlemen who had been rated as millionaires.

Relation of Range to Meat Packing

Several aspects of this period of the cattle industry have had great influence on meat packing. The first had to do with the diseases of cattle. There had been outbreaks of disease among the western livestock in the seventies and early eighties, which had been the subject of government investigation. Indeed, as far back as 1868 the federal government had considered the chance of the spread of Texas fever and had established quarantine stations in western Kansas.¹² At that time it was felt that there was danger in having an unregulated trail from Texas, as the Texas fever seemed to spread from there. There were also foot and mouth diseases and pleuropneumonia, which had become a serious menace. Dr. Hopkins, the state veterinarian of Colorado, spread his idea against disease and the unprotected condition of the open range.

Several states, such as Kansas and Colorado, passed quarantine legislation against Texas cattle. Leaders in the western cattle business saw something had to be done, and Governor Routt of Colorado, Conrad Kohrs, and Granville Stuart of Montana, and in the East, DeWitt Smith of Bates, Illinois, and Alvin H. Sanders, editor of the *Breeders' Gazette*, worked out

¹² U. S. Agric. R., 1868 5; 1870, 40-42; 1871, 32-33; 1872, 33-34; 1878, 24-26; 1882, re Texas or Spanish fever.

a plan which resulted in the organization of the National Cattle Growers' Association of America. A convention was called which met in St. Louis in 1884.

A suggestion had been made that there be set aside land for a National Cattle Trail from Texas to the ranges.¹³ Land for such a trail was to be withheld from private entry. It was to be 690 miles long, with an average width of three miles. Its area was to be 2,070 square miles, or 1,324,800 acres. The Texas cowman urged it, for he saw it as the only outlet for his products—the northern pastures. He was being crowded by the steady increase in his herds and his market lay out of the state. However, the agitation in the convention and through the country at large for the trail came to nothing. The really valid objection to it was in the changed and changing condition of stock raising, and against this there was no use in fighting.¹⁴

Origin of the Bureau of Animal Industry

One other important work which this convention at St. Louis accomplished should be noted. It empowered its executive committee to urge upon Congress the creation of the Bureau of Animal Industry, and this was soon established. Since then the importance of this bureau in the development of the meat industry in the United States has been fundamental.

The final aspect of the range cattle industry to be considered in this chapter is its financing. The expansion of the boom in the eighties was financed principally by actual money put into shares of the cattle companies. When this source was exhausted the progressive cattle owner had to get temporary loans in other parts of the country, and especially in Chicago.

¹³ See Nimmo Report (1885) for details.

¹⁴ Nimmo Report (1885) p. 35.

H. Exec. Doc., 2 Sess., 48 Cong., Vol. 29, serial No. 2309 gives this explanation: "A fact that a very large number of the present occupants of the ranges, a majority is openly and earnestly opposed to the driving of Texas cattle to the northern ranges upon purely commercial and economical considerations. (1) They do not wish to be confronted by the competition of the Texas cattle in their midst. (2) They find that the Texas cattle in many places eat out the grass upon ranges which for years past they have regarded as by prescriptive right their own. (3) The contact of their herds with the Texas herds tends to depreciate the breed of their cattle owing to the fact that the Texas herds usually contain a certain proportion of Texas bulls and cows and bulls intermingling on the range."

Lyman J. Gage, president of the First National Bank of Chicago, made many loans to big cattle owners in the West. The cattlemen deposited in the fall and winter and borrowed in the summer. This grew to be a big business. By 1894 the cattlemen were selling paper to the trust companies, and it classed with commercial paper. Advances against stock cattle were not made. Loans were against steers on the range that had been wintered, or in cattle and sheep in the feed lot. It was in the eighties that the business of cattle loans, as at present carried on, really got a start.

The Passing of the Range

In the years from 1886 to 1890 it was becoming plain that the old range industry was being revolutionized. The Kansas granger was pushing westward, building fences and standing on his rights as a homesteader, and railroads were threading their way over the country. The granger opposed the Texas herds crossing his lands, and fierce feuds developed between the cowboys and the settlers.

The federal quarantine, the barbed wire fence, and the homesteader seeking to farm and raise a few corn-fed as well as grass-fed cattle, where the cattlemen had grazed thousands, were the three factors which destroyed the old range industry. According to Thompson, "The day of the ranch farm was past the dawn." As Roosevelt wrote in his "Autobiography," "the great unfenced ranches, in the days of free grass, necessarily represented a temporary stage in our history."

CHAPTER IX

EXTENSION OF LIVESTOCK MARKETS—1865-1885

Eastern Meat Demand

After the Civil War, with the supply of livestock for the increasing industrial population of the East being raised on the great ranges of the West, it was necessary to develop means for its transportation across the continent. Eastern cities like Philadelphia, New York, and Boston depended for meat on the farms west of the mountains, and the fact that their situation was becoming serious is indicated by a special article entitled "Meat Supplies of Great Cities," in the United States.¹

This necessity for finding means of getting meat to the East was met by the construction of railroads and the extension of livestock markets. Indeed, without the railroads, the future development of the livestock industry was impossible, and the influence of railroads has been fundamental in the growth of the Middle West. "The great grain fields of Western Ohio, Indiana, Illinois, and Iowa, have been mainly cultivated because the railroads made the products marketable and profitable" is the statement of the Census Report for 1860 on the effect of railroads on agriculture. The effect of improved means of transportation on the value of produce in the interior is shown by the trend of prices at Cincinnati from 1826 to 1860. From 1835 to 1860, under the influence of railroad competition with canals, the price of corn advanced 50 per cent and that of hogs 100 per cent. Another way in which the influence of railroads was favorable to agriculture was in

¹ Agricultural Report for 1870-1871.

increasing the values of land, e.g., in Illinois from \$1.25 to \$11 an acre.

It is significant that during the same period that the range cattle industry was developing in the West the railroads to that section of the country were being built, and by 1875 were ready for the commercial application of the idea of the dressed beef traffic, which was to revolutionize the meat industry and its distribution methods.

In 1860 there were 30,000 miles of railroad in the United States, which included construction in every state east of the Mississippi River. In 1865, this had increased to 35,085 miles. During the following 23 years, up to 1888, there were three great waves of railroad construction, checked only by financial depressions. As a result, in 1888, there were 121,000 miles of new railroads. A remarkable fact of the first 8 years of the period, 1865-1873, when the new cattle supply of Texas was coming north to the range country, is that the railroad mileage increased 100 per cent, the first Pacific railway was completed, and construction was begun on a second one. Most of this expansion was in the West.

Railroads and Livestock

One must not jump to the conclusion, however, that all development was due to foresight and because of possibilities that were realized to exist in transporting livestock. On the contrary, one cause of the excessive mileage being built was to save from lapsing the great grants of land made by Congress. Following the depression of 1873 there was little done until 1879, when railroad construction revived and three additional transcontinental railroads were finished—the Northern Pacific, the Atlantic and Pacific, and the Southern Pacific. In the same interval the Union Pacific, by the construction of its Oregon Short Line northwest to a connection with a branch of the Oregon Railway and Navigation Company's system, the Atchison, Topeka and Santa Fé, by construction of its line to a con-

nection with the Southern Pacific, and the Chicago, Burlington and Quincy, by the construction of its Denver extension, added three other important routes to the Pacific Coast.

In the earlier part of this period, from 1865 to 1885, the railroad's function was simply to provide means of transport for the ever-increasing numbers of livestock, at first from Texas to the ranges, and later from Texas to Chicago and the East; but as the railroad map extended into the heart of the range country, it proved in the latter half of the period to be the most important influence in changing the cow country and in bringing the boom days to an end through carrying the settler west.

At the end of the Civil War there were several great trunk lines radiating from Chicago, making Illinois, Iowa, Minnesota, Nebraska, and Dakotas, and all west of the Rockies tributary to it. Indeed, St. Louis complained that no trunk lines yet led through that city, although as early as 1857 the Ohio and Mississippi Railroad was extended from Cincinnati to St. Louis, where it connected with the Missouri Pacific, which was then under construction from St. Louis to Kansas City.

Railroads Needed Traffic

These lines to the Mississippi River were looking to Texas for traffic. One of the pioneer cattlemen, Joseph G. McCoy, in his book, "Sketches of the Cattle Trade" (1874), writes of the principal western railroad lines engaged in this livestock traffic. Of these, the Hannibal and St. Joseph, terminating at Quincy, Illinois, where both Chicago and direct Buffalo connections were made, was the first to appreciate and encourage the western cattle trade.

Shortly after this, the St. Louis, Kansas City and Northern Railroad, which formed with the Chicago and Alton a short direct route to the grazing and feed regions of central Illinois as well as the Chicago market, followed in developing the cattle traffic. West of the Missouri River the Kansas Pacific, now

the Kansas branch of the Union Pacific and the Kansas and Fort Scott, later the Kansas City, Fort Scott and Memphis, entered the field of livestock production by branch or feeder lines and gathered the livestock from the ranges and concentrated it at Kansas City.² The Missouri Pacific and Kansas City, Lawrence and Southern, which ran through a rich grass country, also did a good cattle business from the start. These railroads opened the way for the Atchison, Topeka and Santa Fé, which by the nineties had grown to be the greatest cattle road centering in Kansas City, for it penetrated most of the southwestern range country and had branches reaching out and drawing shipments from all sources.

Turning Point for Livestock

The advent of the railroads was a turning point in the development of the livestock industry, but the railroads themselves were not the first to see the possibilities in the transportation of cattle. Instead, it was the Texas drovers who believed that railroad transportation at reasonable rates to Kansas City or Chicago, or some other large center, would be the solution of the problem. This revolutionized the methods of transporting beef to the East. In this progressive step Joseph G. McCoy was the pioneer in adapting the Kansas railroads to the Texas cattle industry. As a result of his efforts the successive points at which the cattle trail crossed the transcontinental railroads became one after the other great cattle markets and shipping points.³ These were the famous or notorious cowtowns.

The first of these markets and shipping points was Abilene, Kansas, on the Kansas Pacific Railroad. McCoy selected the spot and with difficulty persuaded the railroad to make rates and give facilities. He chose Abilene because the country was entirely unsettled, well-watered, had good grass, nearly all the area was adapted to holding cattle, and it was the farthest point

² Powell, Cuthbert, *Twenty Years of Kansas City Livestock Trade and Traders*, pp. 78-79.

³ McCoy, Joseph G., *Sketches of the Cattle Trade*, p. 50.

east at which a good depot for the cattle business could be made. The news spread that a market and an outlet for cattle had been established at that point. This was in 1867. The first year some 35,000 cattle were driven north to Abilene and shipped east from there by rail. On September 5, 1867, the first shipment of twenty cars left for Chicago. The second shipment went to Albany, New York.

New Methods Started

Abilene thus proved to be the turning point from the old to the new methods of bringing livestock from the West to the East. Texas cattle became popular for packing purposes and the demand increased. It was stated that a fat Texas steer was better for packing purposes than a native, that its meat was better "marbled," i.e., the fat was distributed in alternate layers with the lean fiber, and the meat when cut presented the appearance of variegated marble.

Other cowtowns, which had their day as the railroads pushed their way ever westward, were Newton, where the cattle trail crossed the Atchison, Topeka and Santa Fé, and Baxter Springs, on the Fort Scott and Gulf Railroad. With the advance of the settler the cattle trail shifted to the west. After 1876 the chief shipping point on the Kansas Pacific was Ellsworth, 40 miles west of Abilene. At a later date Hayes City took its place. On the Santa Fé, Dodge City became more important than Newton. It was regarding this Dodge City that the saying arose describing those cowtowns that there was "no Sunday west of Dodge City, and no God west of Pueblo."

In 1865 Atchison in northern Kansas had been the chief point of departure west. Omaha had not yet become important, for at that time it had not been reached by the railroad. Leavenworth and Kansas City were becoming markets of significance, with the latter having the better prospects. Its future, however, was not to be that of a mere transfer shipping point, but as a great centralized livestock market. The

same is true of Omaha which continued to increase in importance as a livestock center after it became the starting point of the Union Pacific. With Council Bluffs, it grew to be the western focus of the rapidly building railroads which were being constructed all over these three states, Illinois, Iowa, and Missouri, and on which the prosperity of the corn belt as a livestock feeding and fattening ground was largely based.

Transporting Livestock

The second point of consideration in tracing the development of livestock distribution in the early years of the modern period of the meat packing industry is the actual transportation of livestock.⁴

There is no doubt that ignorance and unnecessary cruelty account for the situation in livestock transportation in the period under review. In their report for 1870 the Massachusetts Railroad Commissioners state that "shrinkage between Chicago and Boston is 10 to 15 per cent," and add:

Cattle trains yield the road to most others and pass hours on the sidings; the animals are without food or water and often with insufficient ventilation in summer or shelter in winter; they are jolted off their legs and then goaded till they struggle up, for they can not be permitted to lie down. They thus arrive at their destination trampled upon, torn by each other's horns, bruised, bleeding, having in fact suffered all that animals can and live. Under the most favorable circumstances they leave the train panting, fevered and unfit to kill; under the least favorable, a regular percentage of dead animals is hauled out of the car.⁵

This treatment made the meat almost unfit for food.

Until the seventies railroads were poor, their construction was hazardous and costly, equipment meager and primitive, and the service as a consequence, inadequate. This pioneer

⁴ See Report of Commissioner of Agriculture, 1872; and George F. Angell, President Massachusetts Society of Prevention of Cruelty to Animals, pamphlet, "Cattle Transportation in the United States."

⁵ Report of Massachusetts Railroad Commissioners (Jan., 1871), p. 31.

transportation for livestock has been described recently in the *Breeders' Gazette*. The writer, James E. Downing, says:⁶

Accommodations for human beings as well as livestock were crude and uncomfortable. Freight rates were high, often more than double rates today, and they were based on carload lots instead of cents per pound.

The cars were equipped with hand brakes and old rubber springs that soon became hard. Trains were coupled with long links and pins and the great amount of slack in a freight train caused a tremendous impact at every movement during the journey. On Western roads, old, wood-burning engines, equipped with link and pin couplings and hand brakes, slowly dragged the trains, usually starting them with a jerk and stopping them by reversed gear, causing everything not nailed down to go into a heap at the far end of the car.

The average schedule time for trains, including stops, on the five leading roads in the West in 1873, was 10 miles an hour, while the highest speed allowed was 12 to 15 miles per hour. These trains ran on short, light, iron rails, joined with the old "iron chairs" spiked into wooden ties. The roadbeds were rough and poorly ballasted; with excessive grades, wooden bridges and trestle work, and everything was in a poor state of repair.

III Treatment of Livestock

The high arbitrary carload rates then charged for the transportation of stock induced overloading as a measure of economy. The result was that the weaker animals were knocked down by the bumping and rolling of the train, and trampled upon by the others until helpless or dead; or, if they were able to rise, were frequently so injured that they afterwards died. In hot weather their suffering was intense. All this added to the death toll and loss to the shipper.

It was the invariable custom for shippers and attendants in charge of cattle shipments to carry lanterns and an instrument known as a "prod pole." It consisted of a heavy handle, nearly six feet long, with a sharp iron or steel spike extending from one end a half-inch or more. This was used to prod the other animals in the car aside, while a "down steer" could be encouraged by the sharp point to take his place in the ranks. The prod

⁶ *The Breeders' Gazette* (Aug. 25, 1921), Vol. LXXX, No. 8.

pole was also equipped with a flat-headed screw, driven into it near the "business" end, and extending out a short distance at right angles from the pole. When the "down steer" refused to respond to numerous jabs and such language as was employed on those occasions, the end of the pole with the attached screw was engaged with the matted end of his tail, and by sundry twists, turns or pulls on the pole a severe strain was applied to that sensitive appendage. If the prostrate steer had life or strength enough left in him to rise, this treatment would bring about the desired results; if he continued in an indifferent attitude, he was considered in a bad way, and a dead steer when the market was reached.

In the early days unloading gangs at the markets carried ropes for the purpose of dragging out dead and crippled cattle from the cars. The principal buyers at the stockyards had men stationed at the scales regularly to watch for broken-ribbed cattle, which were frequently found. Five dollars per head was deducted from the purchase price of every unsound steer, buyers sometimes refusing to take them at any price. Overloading was intensified by the high prices paid for animals kiled en route, which sometimes brought almost as much as the live ones. In 1869 Berkshire hogs taken dead from cars sold regularly at \$4.50 to \$5.00 per cwt. Railroad pens at places where the stock was loaded or unloaded were as a rule not sheltered, and much of the time knee-deep in mud and filth, making it impossible for animals to lie down to rest.

First Stock Cars

Even these primitive methods put stock on the market in less time, much better physical condition and reduced the loss of weight. The railroads began to cater to this new source of revenue, and the first permanent stock cars were built. The old cars in which fuel for the engine was hauled were used as models. The old cars had an unoccupied space of two feet at the end of the platform or floor, in which stockmen used to ride, and frequently sleep. The cars having been built without roofs or hayracks, the fodder or hay was thrown among the animals, and branches of trees were placed over the crossbars to afford shade and shelter from storms. The permanent roof originated not so much as a shelter as to prevent the escape of small animals. There was great difficulty in hauling mixed shipments. At first hogs were loaded on the floor of the car,

and sheep on a temporary deck above. The frequency with which shippers experienced losses from sheep jumping over the top of the car caused the method of loading to be changed, and the reverse was tried; that is, the hogs were loaded on the temporary deck above. But this was found impracticable, because the sheep became foul from the droppings of the hogs. The difficulty was finally overcome by loading the sheep on the upper deck and constructing a permanent roof to prevent their jumping overboard. This was the origin of the present double-deck stock car.

On the first cars brakes were applied to the front trucks only; they were operated by a shaft having a cross ram with two upright handles, the shaft extending through the platform at the end of the car.

Livestock Transportation Laws

Such was the status of the transportation of livestock previous to the adoption of the Federal and State laws which required that livestock en route to market should be unloaded and given five hours of rest with feed and water after having been on the cars continuously for 28 hours. The law was first enacted by the legislature of Illinois in 1869, and was framed to meet the transportation conditions of that time, which were even more primitive and barbarous than those of 1873, when it was adopted as a Federal Law. A violation of the Illinois law subjected the offender to a fine of not less than \$3.00, nor more than \$200. The Federal law has been amended as changing conditions have made it necessary. Experience showed that it was dangerous to attempt to unload sheep from cars after dark, so an exception was made by which they might be kept on cars for 36 hours, if the period of 28 hours ended after nightfall; but 36 hours is the limit of time that they may be kept aboard without unloading.

But this care for livestock came only by slow degrees and is not perfect even yet. With the establishment of the earliest cowtowns, and the first experiment from Abilene by the Hannibal and St. Joseph, all the railroads were anxious to carry as many cattle as possible, but it was only in time that competition forced them to provide stockyards and better care on the journey through facilities for feeding and watering the stock. The

Northern Pacific in 1885 met this need by disembarking the cattle at stations where good pasture was to be had and allowing them to graze for several hours each day. The owner of the livestock was given a free passage on a passenger train and also a number of cowboys, who traveled in a special car attached to the cattle train.⁷ A little later other railroads saw that something more must be done, and so they began to improve their cars.

Different Types of Cars

Of the several kinds of stock cars in general use by 1888, the Burton car was the best, but it had the disadvantage of being permanently divided into compartments, which interfered with return freight.⁸ To remedy defects of the Burton car an adaptation to meet the conditions was made. The new car was called the Newell car. It carried troughs and feed racks which could be folded out of the way to permit the carrying of freight. Later on a stock car was developed which was modeled on the Pullman passenger car. It had 52-inch steel-tired papier-maché wheels, elliptic springs, Westinghouse air brakes, and automatic couplers to prevent jars. Cattle were driven into these cars and boxed off in separate compartments by transverse slats lowered from the roof. There was enough room in each stall for the animal to lie down at will. The animals were fed by having food dropped from a bin in the roof into mangers in the side of the car. From a tank in the rear water was supplied to troughs at the side of the car by pipes which ran around the car on the outside. Fan wheels on each end and a double roof kept the car well ventilated in the warmest weather.⁹

⁷ Bancroft, H. H., *History of Washington, Idaho, and Montana*, pp. 736-737.

⁸ The advantage of the improved car was set out in the report of Erskine R. Merrill, general agent of the Burton Stock Car Company. He pointed out that cattle weighing 935 pounds in Winslow, Arizona, lost only 53 pounds on the trip to Kansas City, some 1,204 miles, in 72 hours, the cattle being watered and fed twice daily. On the other hand, a trip of 1,196 miles in ordinary cars which took 5 days, the cattle being unloaded at feeding time, resulted in an average loss of 185 pounds per head.

⁹ H. Misc. Doc., 50 Cong., 2 Sess., No. 139; also Love, Clara, *Southwest Historical Quarterly*, Vol. XX.

Among the stock cars which are still common was the Mather car. The originator of it was A. C. Mather, who became interested in 1881 in improving the conditions of transportation of livestock. He designed an improved car, but was unable to get the railroads to build his type of car and had to do so himself, organizing a company for the purpose—the Mather Stock Car Company. A committee of the United States Senate investigating the transportation and sale of meat products in 1889 was told that the shrinkage in weight of stock was 65 per cent less in these palace stock cars than in ordinary cars, in which the shrinkage was often 8 to 10 per cent of the total weight of the animals.

By 1889 there were seven companies operating stock cars and these have in the main continued in the business. The railroads, however, have added stock cars to their equipment and now own more than do private companies.

Railroads Not Altruistic

While the railroads did revolutionize the methods of marketing the livestock supply of the United States in the seventies, it must be noted that they were not guided by altruism. True, often the rates from the West to the great cattle markets were reasonable, and had an important part in building up the present system of centralized markets. But at the same time the railroads were in the heyday of that period of their history when their attitude towards the public was that of the remark attributed to Vanderbilt, although always denied by him, "the public be damned." Therefore, the rates from the fast-growing important livestock markets of the Middle West in the Corn Belt—St. Louis, Kansas City, and Chicago—were more and more regulated in their interest. The first period of railroad combination to charge exorbitant rates lasted from 1873 to 1878. That it stirred up public opinion is shown in a pamphlet written in 1878, entitled "The Railroads! The Stock Yards, The Eveners, an Exposé of the Railroad

Ring.”¹⁰ As a result of this outburst of public feeling the railroads thought it wise to change the form of pool from a traffic pool to a money one.

Protection from exorbitant charges was asked on two grounds: (1) that livestock were so ill treated in transit that they arrived in unhealthy condition; and more important (2) that a combination of railroad interests and the interests of the stockyards men at the great shipping points discriminated against the producers of livestock by charging twice as much for transportation as was charged for carrying other staple articles to the East.

As to the first charge, there was a statute passed shortly afterward which required all the railroads carrying livestock to unload them in prepared yards, where they were to be supplied with food and water and given five consecutive hours' rest each day. Unfortunately, for a long time the law was so defective that it was often disregarded.

Roads Dominate Long Haul

The exorbitant double charge, it was proved, was due to combination.¹¹ To quote the argument of the attorney before the House Committee on Agriculture in 1878:

It is plain to anyone that the lighter and less important supplies come to the markets of our cities by all the roads, rivers, canals and railroads that approach a great city; but that these means of transportation drop off one by one as the distance increases and the bulk of the article increases until when we reach the food of the million, our Eastern cities must depend absolutely upon the four trunk railroads that pass the mountains and penetrate the deep meat producing region in the Mississippi Valley. It is therefore not only possible for these roads to exercise a very great influence on this trade as on all others going east and west, but a greater power because, while there are many ways for the great majority of articles, there are only

¹⁰ This was a reprint of the argument of J. F. Rusling on behalf of the producers and consumers of livestock before the Committee on Agriculture, U. S. House of Representatives, March 18, 1878.

¹¹ See Vest Report (1890), pp. 2, 16.

four ways open to the meat trade that must come from the far west.

The railroads when united have no competition, practically, for they alone reach out and take the cattle off the cheap pasture lands and set them down in the eastern markets. In order to destroy competition and keep up high rates, it was only necessary for these roads or a majority of them to agree on a rate and agree to supply stock cars only at the yards of certain large stock dealers at the great shipping points in the west. Accordingly, the railroad officials and owners of stockyards from which the farmer and drover of the west can alone ship cattle east, have organized an association and placed the power to control this trade in the hands of select men called "Eveners." We have then the railroads, the stockyards and the eveners, who are parties to an agreement which robs the producer and the consumer of meat by maintaining the cost of its transportation at twice the cost of any other article. It is done in this way: the railroads agree; (1) to charge \$115 per car on all livestock shipped from Chicago or St. Louis to New York and this is paid, of course, by the owner of the stock; (2) the railroads agree to pay to the "eveners" \$15 for each car of stock shipped from *any point* west of New York, and this without regard to whether the stock is shipped from the yards of the men belonging to the Association or not; (3) the net sum received by the railroads belonging to the association (i.e., \$100 per car) is pooled, and the sum total is divided between the roads, without any reference to the number of cars actually transported by each.

This arrangement exists between the Pennsylvania, New York Central and Erie Railroads, i.e., all the great lines except the Baltimore and Ohio, that can carry a freighted car from the Mississippi to the sea. . . .

Eveners Aid Railroads

The link that binds these great roads together and makes it possible for them to control the cattle trade despite all that producers and small dealers can do, is the association of Eveners, to whom the roads pay \$15 per car on all cattle shipped from any point to New York. Without them the roads could not possibly keep up the high rates for cattle transportation.

While this Evener combination ended in 1879, there were other and even more powerful associations between railroads,

such as the Central Traffic Association, including nearly all the railroads west of Pittsburgh, and from Chicago to the Ohio and Mississippi rivers, and the Trunk Line Association at New York, which included all lines running east from Chicago. These were really one combination, for the Trunk Line Association, by means of the connecting lines, controlled by the great eastern roads, the Pennsylvania, New York Central, Erie, and Baltimore and Ohio, all of which belong to the Trunk Line Association, dominated the Central Traffic Association. This was the situation as late as 1890.

The result of this long-continued policy on the part of the railroads was to give greater and greater prominence to Chicago. The marketing of all western cattle tended to center in that city. St. Louis and Kansas City became relatively less significant as cattle markets, and as a necessary consequence of this concentration also of the cattle trade at Chicago, there were established stockyards at places such as Buffalo and Albany to take care of the eastward flow.

Growth of Markets

The question of the relative situation of the livestock markets of the country at that time is an important one. As has been noted, the cattle markets of the United States migrated from east to west, following closely on the settling of the country. It was believed at one time that Albany in New York State was to be the final gateway for western cattle. Then Buffalo, Pittsburgh, and Cincinnati were in turn regarded as the future great markets of the United States, but as has been seen, Chicago by virtue of location and railroad facilities became by 1870 the largest cattle market in the country.

By the period we are dealing with, the three factors of the large modern livestock markets had been established at Cincinnati and Chicago. With the organization understood, it was natural to set up similar centralized markets further west. The first of these was at Kansas City, where in 1871 the Kansas

City Stockyards were opened for business. The next year the St. Louis National Stockyards began operations, and in the next decade, in 1884, the Union Stockyards Company of Omaha was organized, followed in 1886 by the Denver Union Stockyards Company, and the St. Paul Stockyards Company.

The creation of the Kansas City livestock market was due to necessity. With the growth of the livestock industry came a demand for a home market for the farmers' and ranchmen's maturing stock. The cattle raiser, failing to sell on the prairies, wished to sell at the first point possible. Buyers from the East preferred to buy at Kansas City rather than go to the prairies. Packinghouses were being built at Kansas City. The only drawback was the fact that prices were at times lower than further east. Yet when freights and charges were deducted this disadvantage was not an important one, in fact. On the other hand, as the region directly tributary to the Missouri River for 100 miles on each side developed, it proved to be good corn-growing land, like Illinois. So the feeding states for cattle and hogs were extended. There was an absolute necessity for another livestock center in the Missouri Valley and Kansas City was the best point.

Kansas City Stockyards

This was decided by a few enterprising railroad officials and stock traders who, in 1870, built the first stockyards west of the Missouri River at Kansas City. It was a crude and small place. Yet there were pens and scales and a place for trading and a home market for the constantly increasing number of meat producing animals in the West. Weights had no longer to be guessed at and bank facilities were at hand. These made it possible to carry on larger and more profitable trades within much less time and with less expense than in the old way, where the trader had to drive to the country, carrying currency with him, and rely on his eye in judging the weight of an animal. Such a market brought competition into play.

The moving spirit was Colonel L. V. Morse, at that time superintendent of the Hannibal and St. Joseph Railroad, that was doing the bulk of the stock business out of Kansas City. An area of 5 acres was fenced, divided into 11 pens with 15 unloading chutes and a small pair of Fairbanks scales were put in. Thus was organized the first livestock trade west of the Missouri River, and the nucleus of the Kansas City Stockyards.

In March, 1871, a joint-stock company was formed to erect and operate a complete stockyards. These yards covered 26 acres with all the apparatus of today—pens, lanes, scales, barns, and a business office building. Every railroad entering the city soon connected with the yards, and business was brisk.¹² By 1876 the area of the yards had increased to 100 acres.

Livestock Exchanges

At Kansas City there shortly emerged, as at Cincinnati and Chicago, another institution, the livestock exchange, which has played a great part in our central markets. This institution originated in the livestock markets of the United States because of a need for some way to check dishonest and irresponsible buyers and sellers, unjust discrimination in railroad rates and commissions for selling livestock, the slaughter and sale of diseased animals for food, injurious legislation, and other wrongs and abuses that could not be suppressed in any other way than by concerted action of all those associated with the conduct of the market.

Out of the first small exchange have grown the others, now powerful organizations, looking in efficient manner after the matters just listed. The livestock exchange was for a time an association composed of livestock dealers in a central market, banded together in a voluntary association for providing a

¹² The original officers of this stockyards company were J. M. Walker, Chicago; George H. Nettleton, General Manager; Jerome S. Smith, Superintendent; and George N. Altman, Secretary.

“gathering place” where members could meet and exchange views affecting the market, these members including livestock producers, shippers, packers, commission men, and bankers. It also had facilities for making more efficient and speedy the transactions of the market.¹³

The Kansas City market showed marvelous growth. In 1869 it received only 4,450, but in 1884, some 533,526; in 1871 hog receipts were 41,036, while in 1883 they were 1,379,005. Sheep receipts in 1871 were 4,521; in 1883, 119,180.¹⁴ The scope and source of the supply of livestock is shown in the figures of livestock for 1883 brought by the various railroads to this market.

St. Louis and Cincinnati Markets

Coming further east to St. Louis one must note that it is quite likely that the cattle market there had its beginning at least as early as that of Chicago. It also showed great growth during the period from 1865 to 1884, but its significance is not as considerable, since it was looked on by many as a mere transfer station on the way to Chicago.

Cincinnati, which had been outstripped by other cities as a meat packing and livestock center, showed a great increase in its livestock trade after the opening of the United Railroads Stockyards in 1874. Those yards attracted trade from a wider region and in larger volume. Increased rail communication with Texas resulted in bringing a better class of animals from that state. Of the eastern markets Buffalo was the most important.

Chicago

There remains for consideration Chicago. At this point it seems well to give some idea of the growth and volume of the

¹³ *The National Provisioner* (Feb. 3, 1900), Vol. XXII, No. 5, article on livestock exchanges, by W. H. Thompson, President, National Live Stock Exchange.

¹⁴ U. S. Department of Agriculture, 1st Annual Report, Bureau of Animal Industry (1884), p. 248.

trade, leaving for a later chapter a discussion of the actual workings of the market.

The different kinds of cattle which came to Chicago in 1884, were made up as follows:¹⁵

RECEIPTS	CATTLE	SHIPMENTS	SLAUGHTERED
Natives.....	1,000,000	720,000	280,000
Range cattle.....	400,000	71,000	329,000
Texas cattle.....	416,000	none	416,000

In this period the Chicago, Burlington and Quincy Railroad transported about one-third of the cattle to Chicago. It ran through a corn belt unsurpassed in the United States. The Chicago and Northwestern Railroad continued to maintain second rank as a feeder to the great cattle market.

These central livestock markets developed naturally and inevitably in one great section of the country—the Middle West. Here were the seven “corn-surplus states”—Ohio, Indiana, Illinois, Iowa, Missouri, Kansas, and Nebraska, known as the “Corn Belt.” During this period, 1865-1885, they became the great corn-producing area and constituted the natural center of beef production. About one-third of the cattle of the country, other than milch cows, are contained in the states mentioned, and their value is equal to about two-fifths of the total value of such cattle in the United States. Further, large numbers of cattle are shipped into these states to be fattened and forwarded to market.

Corn Belt and Livestock

Corn-fed cattle are the distinctive feature of the cattle industry of the United States. It is important, therefore, to consider the trend of general conditions surrounding the industry in that section and the economic factors affecting it in this constructive period which prepared the way for our present livestock marketing system.¹⁶

¹⁵ Nimino Report, Appendix No. 2, p. 87.

¹⁶ This survey of the trend of conditions in the Corn Belt is based on circular No. 175 of University of Illinois Agricultural Experiment Station, “Cattle Feeding Conditions in the Corn Belt,” by Herbert W. Mumford and Louis D. Hall (1914).

During the period of settlement, and the earlier years of cultivation of corn belt lands—a period extending from the fifties to the nineties inclusive of the last century—these lands generally were stocked with cows of beef type; and while the country was being brought into cultivation they became a combined breeding, grazing, and fattening ground for cattle. Such localities were admirably suited to beef production because of the abundance of cheap grass and corn they afforded. As the remarkable corn-growing possibilities of the soil and climate in the Corn Belt became more and more evident and the demand for corn grew greater, the westward movement of agriculture naturally stimulated the growing of corn, and to a corresponding degree, diminished the area of grazing land.

At the same time that conditions within the Corn Belt were tending to reduce the rearing of beef cattle there, the industry was extending on the great breeding grounds of the West. Thus an increasing supply of cheap stockers and feeders from the range was a further large factor in causing the abandonment of cattle raising by many farmers, who reasoned logically that calves could be produced and grown more economically on the cheap grass lands of the West than on corn belt farms. Moreover, the attractive opportunities which the range country offered the cattlemen induced many livestock farmers of the Mississippi Valley to migrate west, thus diminishing still further the proportion of cattle feeders to grain growers in the central states. It was estimated that only about 15 per cent of the native steers marketed in Chicago from Illinois were carried from birth to maturity without changing hands.¹⁷

Beef Fattening

In spite of the rapid extension of the acreage devoted to corn growing, and the great demand that had arisen for corn

¹⁷ Henry, W. A., *Feeds and Feedings* (1st ed., pp. 46, 389). The statement of John D. Gillette, Elkhart, Macon County, Illinois, is interesting for he became between 1864 and 1878 one of the greatest beef producers in the country.

for other than feeding purposes, the crop was still fed chiefly to farm animals. As nearly as can be estimated, 85 per cent of the corn produced in the United States is fed to livestock. It is, of course, more largely sold off the farms of the corn belt states than those of other sections of the country, but probably not far from one-half of the crop of Illinois is fed on the farm. For beef production in the Corn Belt has become largely a steer-fattening enterprise apart from breeding in Illinois and Indiana. In Illinois more than one-half of the cattlemen are feeders who purchase the cattle they finish for market. More than one-third are both feeders and breeders, but even the latter purchase most of their feeding cattle. About 85 per cent of the native beef steers marketed in Chicago are fattened after having been purchased as stockers and feeders. The extent and tendency of this phase of the industry is also shown in a measure by the shipments of stockers and feeders from large cattle markets during recent decades.

Big and Small Feeders

In the evolution, or transition, of corn belt beef production from a cattle raising to a steer-feeding proposition with a large proportion of the feeders purchased at the big markets, the business, to a considerable extent, had gravitated into the hands of men who handled comparatively large numbers of cattle—from a few carloads to several hundred head. Though these professional cattle feeders in most cases were farmers, they usually bought all their feeding cattle and a large part of the corn they fed, used but little of the manure produced, and freely admitted the large element of speculation incurred. The capital, risk, business skill, and distance from markets involved in cattle feeding necessarily deterred many farmers from converting their corn into beef. The proper place and purpose of beef production in the Corn Belt, however, was to provide a profitable market for the crops grown on the farm, and at the same time to conserve the fertility of the soil.

These considerations were of greater consequence to the small farmer than to the "big feeder." The latter made use of his advantages. It is therefore essential to the welfare of agriculture that the business should be distributed more generally among farms of average size instead of being concentrated in the hands of a few farmers and capitalists whose farms, as well as their fortunes, were frequently enriched at the expense of the neighbors whose corn they bought. With a reasonable degree of skill in buying, feeding, and marketing, it was ordinarily safe and usually profitable for the general farmer to engage in the fattening of steers.

CHAPTER X

DEVELOPMENT OF REFRIGERATION

Refrigeration Basis of Modern Meat Packing

As a basis for the development of meat packing in the modern period there has been traced the history of the western range, which brought into being an adequate supply of livestock. Means of transporting and marketing this supply of livestock which developed in the period 1865-1885 have also been discussed. It remains to consider the growth of invention in refrigeration, because it was this factor which made it possible to utilize to their greatest extent the supply of livestock and the methods of transportation and marketing. Refrigeration enabled the meat packing business to operate in summer as well as in winter, and made the distribution system for meats nation wide and world wide. It is not too much to say that refrigeration made possible the present modern meat packing industry.

In 1870—the beginning of the second era in meat packing—there were four things wished for and necessary for the further extension of the meat industry now drawing raw supplies from one end of the country and delivering the finished product at the other. These requirements were means and methods :

1. To prevent premature decay of perishable products.
2. To lengthen the period of consumption and thus greatly increase production.
3. To enable the owner to market his products at will.
4. To make possible transportation in good condition from the point of production to point of consumption, irrespective of distance.

These aims began to be realized in the decade 1870-1880, and from the experimental progress made in those years dates the entire modern industry of refrigeration and the remarkable results of its application in meat packing.¹

Early Experiments in Refrigeration

It must not be supposed, however, that the idea of refrigeration is as new as that. As far back as 1550 Blasium Villafranca, a physician in Rome, produced an artificial reduction of temperature by dissolving saltpeter in water, and in 1607 the first "frigorific mixture" was discovered by Latinus Mucedus, who by combining snow with saltpeter produced very low temperatures. Francis Bacon was also credited with experiments along this line and, indeed, died from a cold contracted by stuffing a chicken with snow. The chief incentive of most of these early inventors, however, with the exception of Bacon, was simply the production of ice, until the requirements of the brewing and meat industries called out mechanical refrigeration.

In the middle of the eighteenth century scientists were experimenting upon "nature's abhorrence of a vacuum," to produce evaporation and refrigeration. It was by the application of this principle that Dr. William Cullen invented in 1755 an ice machine which was the first to produce ice by purely mechanical means. He reduced the atmospheric pressure upon water in a closed vessel with an air pump, the evaporation from the surface of the water being so increased as to produce intense refrigeration and ice. This was the pioneer ice machine of any kind.

In 1824 Vallance patented an ice machine in which a current of dry rarefied air was circulated over shallow pans containing water. The air absorbed the vapors of the water, and the heat necessary to produce these vapors was taken from

¹ For the most readable account of the development of refrigeration in the United States, see article by I. F. Nickerson on that subject in *The National Provisioner* (Nov. 28, 1891), Vol. III, No. 8.

the main body of the water and froze it. The air thus laden with moisture was passed over concentrated sulphuric acid, which absorbed the watery vapors, and made the air fit again for taking up new vapors from the water to be frozen. Thus a continuous process was established. It was about this time that the Royal Institute of England was founded, and Sir Humphrey Davy and Michael Faraday demonstrated that pressure heats the gas, after which it is released to condensers where it liquefies.

Early American Inventions

Jacob Perkins, an engineer and inventor, born in Newburyport, Massachusetts, July 9, 1776, is generally accorded the credit of inventing the first machine which was the forerunner of the modern compression apparatus capable of producing ice in commercial quantities. His patent was obtained in England in August, 1834. The refrigerant employed was ether. The evaporator containing the liquefied ether enclosed a system of pipes, through which brine circulated the temperature of which was thus lowered to 5 degrees F. The brine was then passed into a long receptacle containing boxes filled with water, and having frozen their contents, was piped back to be subjected again to the refrigerating effect of the expanding ether.

Thus the cycle was completed and the principle established, upon which most modern refrigerating machines are founded. The brine, or indirect system, was thus foreshadowed. The Perkins apparatus included the four principal features still in use in all compressor systems today: viz., the compressor, the condenser, the expansion, or regulating valve, and the evaporator.

Professor A. C. Twining of New Haven was the next prominent figure in the invention of ice-making machinery. His patent, dated 1853, corresponds closely in time with that of Dr. John Gorrie, whose patent in 1851 was the first in the

United States for the manufacture of ice by mechanical refrigeration.

A few years later, 1858-1860, Ferdinand P. E. Carré of France placed upon the market a machine which gave birth to the ammonia absorption machine system of today. This really established the modern frozen meat trade, which has been of such commercial and physical benefit. The original machine was a very crude affair, consisting merely of two vessels, one surrounded by cold water, the other containing the ammonia and water. The original patent in this country was dated October 2, 1860, and was reissued February 18, 1873.

First Cold Storage Plant

From the practical application of the progress of invention in refrigeration made thus far, the modern frozen meat trade in the United States appears to have originated at the end of the Civil War in 1865, with A. and E. Robins, dealers in poultry and game, Fulton Street Market, New York City. D. B. Beemer, of Omaha, Nebraska, who at that time was in the same line of business, was naturally curious as to the secret process of preserving, and describes his experience, telling what he learned of the novelty as follows:

On obtaining access to the room my hurried glances about revealed V-shaped galvanized iron tanks hanging down three or four feet from the ceiling (to which they were attached) and glistening with frost, while there were also broad, flat, shallow pans, or platforms of galvanized iron suspended by iron rods from the ceiling, at about six feet from the floor, upon which were piles of fine ice and salt. The bottoms of these pans were glistening with frost, as were also the galvanized iron walls of the room, while boxes and barrels of frozen poultry and loose piles of game were scattered about the floor. The tanks and pans, I knew, had salt in them, cutting the ice, else there would have been no freezing or frost. Lead pipes led from both the pans and the tanks to the sewer to carry off the waste water. Back against the sides of the room were side tanks.

This plant embodied in embryo the plans and ideas, which subsequently enlarged and improved upon, formed the basis on which have been built up the most successful systems of modern cold storage involving the use of ice.

I returned to Chicago and at once built a small freezing room in an upper story of A. P. Stanley's commission house on South Water Street, getting my cold from tanks overhead attached to the ceiling. It proved a success.²

Compressed Air Machines

In the early seventies the so-called cold air or compressed air machines monopolized to a great extent the attention of both inventors and the commercial world of refrigeration. Franz Windhausen of Brunswick, Germany, was the foremost exponent of this type. His first patent in the United States was issued in 1870. The principle was this: The air was compressed, then passed through a cooler, and after that expanded to remove the heat or produce cold. It was in 1878 that he invented his compound vacuum pump for producing ice on a great scale.

From 1873-1875 another German inventor, Professor C. P. G. v. Linde of Munich, introduced his ammonia refrigerating machine. He is now generally considered one of the foremost early exponents of the compression system. This machine was patented in the United States in 1880.

Meat Packer Inventors

Not all these inventors were of the professional class, however, for some practical meat packers aided in the development of refrigeration. An outstanding example was Thomas D. Kingan of Indianapolis, who took out a patent in 1873. Just previous to the time, when ice machinery became reliable for refrigeration, he used a large back-and-forth coil of 12-inch pipe laid in returns in a tank about 12 by 60 by 4 feet deep. On top of this pipe he put crushed ice and salt, blowing air

² *Ice and Refrigeration* (Sept., 1901), Vol. XXI, No. 3, p. 78.

through the pipe into the rooms where the beef or pork was hung or cured. As the return suction came from the other end of the rooms he succeeded fairly well in cooling his packinghouse, until later on he put in some absorption ice machinery of his own designing. In 1875 representatives of a company in Texas went to Indianapolis and arranged with Mr. Kingan to build one of them in its abattoir in Denison, Texas, the results of which proved excellent.³

One of the earliest inventors and builders of refrigerating machinery in this country was Thomas L. Rankin, a native of Ohio, whose first experiments were conducted in the South. His machines were of the absorption type and were used in breweries. The application of Rankin's apparatus included its use for beer coolers, cold storage houses, and the refrigerating of packinghouses and breweries and vessels carrying meats. Rankin's first patent was granted March 28, 1876, and a remarkable success was made of this by David Boyle.

First Chicago Refrigerating Plant

As a result of the development in refrigeration a considerable number of companies were formed from 1876 to 1880 to manufacture ice-making and refrigerating machinery. It was in 1880, for example, that W. B. Allbright, of the Allbright-Nell Company, Chicago, installed the first refrigerator plant in the Chicago packinghouses. In a short time every well-equipped slaughter house had its own chill and refrigerator rooms, in which the meat products could be kept wholesome for long periods of time.

Much remained to be done, however, in order to apply the principles of refrigeration to the meat packing industry in such a way as to make its distribution nation wide. The next problem was to apply refrigeration to transportation. The refrigerating apparatus used for stationary plants is not suit-

³ Prospectus of the New York and Texas Beef Packing Company for packing beef in Texas by means of the processes patented by D. E. Somes of Washington, D. C.

able for a freight car, where the requirements are that the apparatus shall not be unduly heavy or bulky, and that it must be of sufficiently simple operation for a person of ordinary intelligence and without mechanical training.

Applying Refrigeration to Transport

It was during the period of railroad growth and general commercial activity following the Civil War that attempts were first made to maintain in a car a temperature at which perishables could be preserved. In his study of the development of private freight cars, L. D. H. Weld states that the earliest attempts to refrigerate freight cars were probably those made by the Michigan Central Railroad in the early sixties in carrying fresh meat from Chicago to New York or Boston. Ordinary box cars with bins for ice built in both ends were used. A platform built about 3 feet from the floor at each end of the car formed the bottom of the bin. A heavy door the width of the car was hinged to the roof. This door was raised to permit ice to be piled on the platform. It was then lowered to keep the ice from shifting. About 2,000 or 3,000 pounds of ice was placed in each bin. Metal basins were placed to catch the drip of the melting ice, and a pipe drained this through the bottom of the car. This car was inconvenient in that it could be iced only when empty, and inefficient in that it seems to have been able to preserve meat for a few days only. Certainly the temperature could not have been low and no circulation of air was provided.

Some successful shipments, however, were made in these cars from Chicago to New York by attaching a carload of meat to a passenger train as far as Suspension Bridge, New York, near Niagara Falls. It was there transferred to a fast freight train to New York. In this way meat would arrive in New York City within three days after being sent and was usually in good condition. The limited time which the shipment could be in transit, however, and the expense involved in this part passenger

service prevented this method of transportation from being extensively used.⁴

About this same time the Pennsylvania Railroad set aside some thirty box cars for experimental purposes. These, under the direction of W. W. Chandler, who for a number of years was head of the Star Union Line, were fitted with double sides and the space between packed with sawdust. For cooling purposes a box filled with ice was placed on the floor of the car and the door sealed. This car became a large ice box on wheels. The cooling arrangement was changed somewhat later in that the ice instead of being held in a box placed in the body of the car was contained in two chests, one at each end of the car, hung by wire bands from the roof. This car had practically the same objectionable features as did the car of the Michigan Central, in that it could be iced only from the body of the car and it was without circulation of air.⁵

Refrigerator Car Patents

The first American patent for a refrigerator car was issued on November 26, 1867, to J. B. Sutherland of Detroit, Michigan. His car was so constructed that the air admitted at the top passed down through the ice chamber and was discharged into the cooling room near the bottom to reduce the temperature. His claim covered a car with double walls, roof, and bottom with ice chests at each extremity, closed by hanging flaps and having spaces so arranged as to produce a constant circulation of air in the car. From that time on patents for refrigerator cars came fast.

In 1868 George K. Wood of Morristown, New Jersey, brought out a car with a plurality of metallic chambers for the acceptance of way and through freight with an ice chamber above. During the same year William Davis of Detroit, who had been experimenting for three years on refrigerator cars, took out patents dated June 16, and September 15, 1868. The

⁴ Report of Federal Trade Commission on Private Car Lines (1920), p. 26.

⁵ The following extract from Mr. Chandler's memoirs, as cited by C. H. Taylor in his "History of the Chicago Board of Trade" (Vol. I, pp. 369, 370) is of interest: "I had never seen or heard of a 'refrigerator car' at that time nor did I dignify them with the name refrigerator cars, but christened them 'ice-boxes on wheels.' I did not get a patent, but later sundry other people did varying the construction."

Davis car became the best known of the early types and was used considerably during the next few years. Its performance, however, was not wholly satisfactory, and not infrequently was it referred to as the "sweat box," a name probably due to the same fault which had been common in all the earlier experiments, namely, that the car had no provision for circulation of air. The cooling system of this car seems to have differed slightly from other types, in that cylindrical metal tanks of about 15 inches in diameter were placed at each corner of the car. It appears for some shipments, at least, that the ice in these tanks was mixed with salt to obtain a lower temperature.⁶ It was in this car that the first successful shipment of dressed beef was made in September, 1869, which was the real beginning of the dressed beef industry.

The car of A. L. McCrea of Chicago, patented in March, 1869, had interior movable sections, and that of Thomas L. Rankin of Granville, Illinois, patented in December, 1870, was built with ice boxes raised above the roof of the car on either side of the brakeman's walk.

Cars Had to be Simply Built

Some of the American inventors seem to have tried to produce a car with as many mechanical complications as possible, forgetting that all machinery which must be operated and handled by inexperienced labor should be as simple in mechanism as is consistent with the duties it is expected to perform. For example, C. L. Haag and E. Ely of Lockport, New York, found this an obstacle to extensive use of their car. It was cleverly designed, having an ice box at one end of the car with a complicated system of air passages and valves for the regulation of the air currents to the preserving chamber. It had also an observation chamber.

In 1871 A. S. Lyman in New York forced an air current

⁶ Federal Trade Commission Report on Private Car Lines (1920), p. 26. Weld, L. D. H., Private Freight Cars and American Railways, p. 12.

under the roof over the ice into the cooling chamber by means of a wind wheel on the roof of the car. A year later Richard J. Tunstall of St. Louis, Missouri, whose patent was taken out in September, 1872, approached simpler methods and cooled his car with a V-shaped iced receptacle running through the car from end to end and filled from the top, having vertical drips at either end. The Tiffany car patented about this time followed this idea, having two ice bunkers, one on each side of the car. Still later, in June, 1874, H. W. Sanborn of Rochester, New York, made an entirely new departure by producing a car which was automatically self-cooling without the use of ice, being cooled by evaporation of water.

First Refrigerator Car Shipments

By this time several of the packers in Chicago, who were conducting business in the old-fashioned way, and a number of cattlemen who later were to be big packers in the new way, were making experiments with refrigerator cars, feeling that here was a possible means of adding a new feature to their business, a dressed beef traffic to all parts of the country.

The earliest packer to experiment was G. H. Hammond of Detroit, who built a fairly successful meat refrigerator car in 1871. Although not credited with the first shipment of dressed meat from the Middle West to eastern markets he was the first to market western beef by sending it the entire distance by freight. What type of car he had is not quite clear, but the meat came in contact with the ice and became discolored and spoiled rapidly when removed.⁷ "To remedy this difficulty cars were so equipped that the meat could be suspended from the rafters and ceiling, with the result that when the car was in motion and going round curves, the halves of meat were set swinging like pendulums and finally communicated their motion to the car."⁸ This caused several wrecks.

⁷ Federal Trade Commission Report on Private Car Lines (1920), p. 28.

⁸ Armour, J. Ogden, *The Packers, the Car Lines, and the People*, pp. 19, 20.

The next step was the partitioning off of an ice bin or bunkers at one end of the car, the meat being suspended in the body of the car. This was an improvement and meat carried in the cars arrived in better condition.

At the time of these early experiments of shipping fresh meat under refrigeration, Nelson E. Morris was one of the largest cattle dealers in the Chicago market. In addition to dealing in livestock, Morris had operated a packing plant since 1859, and had built up a considerable business in the shipping of packed meat, as well as the local selling of fresh meat. Considering how he might enlarge his market for fresh products, in the winter of 1874, Morris had risked sending a load of frozen beef to Boston in a box car. The meat arrived in good condition and a market for it was found. The following year numerous shipments of this sort were sent, with, generally speaking, good success. The venture was, however, necessarily confined to a small portion of the year, and even then, dependent as it was upon the variations in the weather, it could not become general or extensive. The risk was too high—the loss too great. Evidently Morris was not familiar with the refrigerator car or he did not consider it a practical carrier for his business.

Refrigerator Cars a Commercial Success

One of the most influential figures in the commercial development of refrigerator cars was Gustavus Franklin Swift. He aided materially in revolutionizing the meat industry, creating the dressed beef traffic and the distribution system of the modern packing industry. There are few instances of as great courage in commercial history as he and his associates showed in this struggle. This is a story that will be treated in the following chapter. At this point it is sufficient to note that in his search for a better car G. F. Swift was instrumental in discovering the true principle of refrigeration for freight cars. For he secured the assistance of an

engineer in Boston, named Chase, who discovered this principle, namely, "that a current of air allowed to pass through an ice bunker in the upper corner of a car becomes chilled so that it is heavier than the air with which it comes in contact, and consequently sinks and circulates through the car, the warm air passing out through the ventilator."⁹

Chase not only discovered this principle, but he also devised a practical method of applying it by fastening an ice bunker in each end of the car. The bunker is filled from the exterior of the car through an opening in the roof. This is closed by a plug, which fits into the opening and is further sealed by a hatch door in the roof of the car. The principle of circulation of cool air and the general arrangement of the appliances of this car by which the bunkers could be filled or replenished from the outside, are still in use, though various refinements for convenience or efficiency have been introduced. The car designed by Chase demonstrated its worth at once. Other packers followed in its use, among them Armour and Company, Nelson Morris, Schwarzschild and Sulzberger, and other smaller companies.

Refrigerator Revolutionized Meat Industry

The refrigerator car made possible the development of the great centralized packing industry. Before its use slaughtering was a local business; now fresh meat shipments are a part of international commerce. Without the refrigerator car ordinary improvements in transportation could have affected the packing business but little. Cheaper transportation could not increase the market materially. Faster transportation could make but little difference, for regardless of the speed of the train, the meat would spoil before it could be transported if mechanical refrigeration were not provided. The only meat products which could be shipped were those which had been dried, cured, canned, or otherwise preserved. As

⁹ Weld, L. D. H., *Private Freight Cars and American Railways*, p. 16.

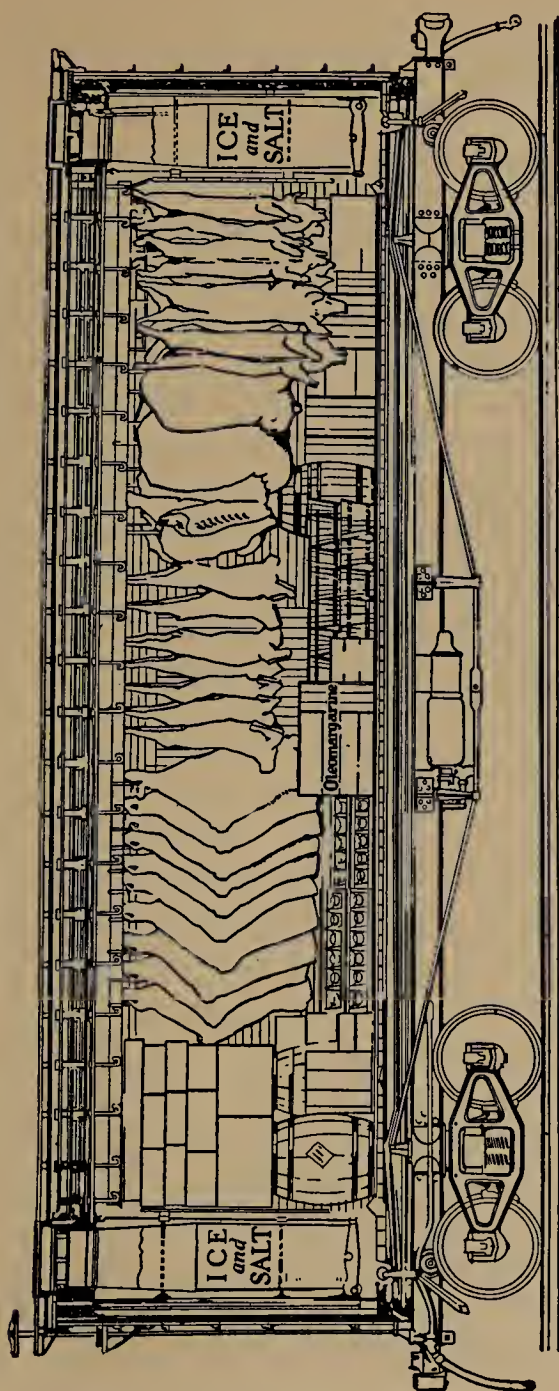


Figure 12. Interior View of a Loaded Modern Refrigerator Car

Courtesy Commercial Research Department, Swift and Company

has been stated, many of these products were packed in containers with salt or brine, from which fact the "packinghouse" takes its name.

Previous to the refrigeration period the fresh or dressed meat business was in the hands of those butchers who slaughtered in or near the community where the meat was to be consumed. With the advent of the refrigerator car a revolution swept over the meat industry. The fresh meat and the perishable packinghouse products could now be shipped to any point. There were, of course, difficulties to overcome—the imperfections of the car itself, the prejudice of the buying public against refrigerated meat, which was industriously fostered by local butchers and cattle shippers, and the hostility of the railroads. The modern packing industry, however, was thus started in response to an economic necessity. In face of that fact the obstacles had to give way.

CHAPTER XI

DEVELOPMENT OF THE DRESSED BEEF TRADE

The New Packers

Until the last quarter of the nineteenth century fresh meats and their distribution were everywhere under the local control of the retail butcher. This was especially true of beef, which was sold dressed for consumption. During the early period of meat packing the name given to men engaged in that business was "pork packers," for they packed pork products. Beginning with 1875, however, the term had to be changed to "meat packers," for in that year there appeared the new packers who were cattle dealers, as, for example, Nelson Morris and G. F. Swift. The change in name connotes a great advance in methods in the American meat industry. Having solved the problems of pork, it tackled the problems of beef, especially that of slaughtering and distributing wholesome fresh meats to the country.

Early Methods Often Unsanitary

Before 1875 local butchers in the United States supplied themselves with meat from the following sources:¹

I. Some few meat dealers, especially those of the cities or larger towns, obtained all their meats from the large packinghouses and they did no slaughtering. This class was not affected by the change, since they were getting the benefit of modern methods.

¹ The contents of this chapter are for the most part based upon personal investigation among retired and active meat men, local butchers, branch house managers, and cattlemen throughout the East and Middle West. The story is therefore absolutely new to written record.

2. In some cases meat men did their own killing, but had no regular place for slaughtering. These men would drive from farm to farm and buy one or two animals, which they killed at the place of purchase, throwing the offal of the slaughtered animals to the farmers' hogs. They would take the dressed or partly dressed carcass to their meat shop and place it on the block.

3. In numbers of cases small dealers who had no slaughter house of their own did all of their killing at slaughter houses controlled by other local butchers.

4. In some cases the farmers slaughtered their own animals and brought them to town dressed or partly dressed, selling them in halves or quarters to the local butchers or to families, hotels, and restaurants. The farmers were in the habit of feeding the offal of slaughtered animals to their hogs.

5. The majority of the local dealers in small towns owned or rented slaughter houses. In nearly all cases these houses were located on, or just beyond the town limits. They were frame structures, generally of one room, built directly on the ground or raised several feet and surrounded by a small yard or, in many cases, situated in a large field.

Farm Killing Drawbacks

In the greater number of cases the butchers controlled a small piece of land, and, as a rule, hogs were kept on the premises to eat the offal. In many instances the houses were located on the banks of rivers or creeks, into which the premises drained. Frequently the offal was thrown down an embankment toward the water, and left there to be eaten by the hogs and rats or to decay and drain into the stream. In some cases the slaughter houses were located on farms. These farms were either owned by the butcher, or a farmer would give the use of a piece of ground on the corner of his premises to the butcher for his slaughter house in return for the use of the offal as food for his hogs.

A very important matter from the standpoint of public hygiene was that in case a town was provided with more than one slaughter house, they were rarely segregated, but were scattered north, south, east, and west, each butcher apparently trying to place his house in such a position as to prevent any undue amount of curiosity on the part of his competitors as to the character of his stock.² Fortunately, slaughtering on farms was not of necessity unsanitary.

Ways to Prevent Disease

Such a state of affairs as that described meant that every slaughter house might prove a center of disease for the surrounding country, spreading trichinosis, echinococcus diseases, wireworm, and other troubles caused by animal parasites, tuberculosis, hog cholera, swine plague, and other bacterial diseases. In the spread of these diseases offal feeding, drainage, rats, and dogs were important.

It was pointed out that these diseases could be greatly held in check, and, in some cases, entirely eradicated in two ways: first, by a reduction in the number of premises on which slaughtering was allowed, on which account it was urged as all important that there should be a segregation of the slaughtering houses, so that all the butchers of any given town would be compelled to do all their killing in a common enclosed and restricted area; second, by regulating the factors concerned in spreading the diseases.

The part of the country to take the earliest steps to change this unsatisfactory and dangerous situation was the extreme East, where the problem of supplying dense urban populations with meat was most difficult. From 1870 to 1875 New York City and Boston attempted to solve the problem, and their work had important effects on the subsequent development of the meat packing industry.

² It is not intended to convey the impression that slaughtering on the farm need be unsanitary. See Boss, Andrew, Meat on the Farm, U. S. Department of Agriculture Farmer's Bulletin No. 183.

Urban Problems to be Solved

In 1870 the Massachusetts State Board of Health in its first annual report set forth the results of their investigation into "Slaughtering for the Boston Market," in which reform was urged on the grounds of public health and economy. For example, in Brighton, annexed to Boston in 1874, there were in 1868 about 50 slaughter houses in full operation, in which were slaughtered 53,000 beeves, 342,000 sheep, and 144,000 hogs annually. None of these establishments was big, but in each the business was carried on in an unsatisfactory, clumsy, and wasteful manner, without proper regard to cleanliness.

In addition to all these slaughter houses there existed in Boston proper, Cambridge, Charlestown, Brighton, Roxbury, and neighboring towns, a number of establishments where the feet, tallow, and bones, collected from the former places, were carried to be melted and boiled. The air for miles around was contaminated by foul odors from vats and badly constructed chimneys. The blood of animals slaughtered in Brighton was for the most part lost, being allowed to run off into the pig pens where that part which was not consumed by the hogs was allowed to lie and putrify in the sun, thus adding to the unwholesome character of the place. Only a very small amount of the blood was used in any way, and never more than 1 cent a gallon was realized from the sale of a small part of it to sugar refiners. The refuse portions of the animals slaughtered were used to feed hogs, which were fattened for the market.³

The Committee of the Massachusetts State Board of Health visited New York, where they found conditions somewhat more sanitary, but the slaughter houses were also too numerous there and agitation was on foot to reform matters. Indeed, in 1874 the medical board of the Roosevelt Hospital protested against laxness in allowing unregulated slaughter houses.

³ The Brighton Abattoir, p. 1.

Remedies Urged

The remedies for this unsanitary state of things were definitely stated by Dr. George Derby, secretary of the Massachusetts State Board of Health.⁴ They were the concentration in large establishments of the business of slaughtering, where every part of the animals could be utilized on the spot in the most cleanly and economical manner without bad odors or waste. Certain essentials representing a great advance in ideas were declared necessary for slaughter houses.

These essentials were: (1) a pavement of stone or some material impervious to blood, (2) an abundant supply of water, (3) complete drainage, (4) vats for the "rendering" of fat and offal on the spot before putrefaction set in, (5) the means of converting blood into blood albumen.

The sanitary advantages of such a system were: (1) the removal of offensive odors, (2) the removal of slaughter house hogs from the market, (3) the ready inspection of meat, thus insuring the rejection of that unfit for food.

The economical advantages were: (1) diminished liability of having meat spoiled by exposure to the emanations from the putrid pig pens, (2) the value of the blood which would be saved and utilized, (3) the savings which must always accompany order, system, the division of labor, the avoidance of transportation, and the doing of any business on a large scale, (4) the greatly increased value of land in the vicinity of the slaughter houses.

At the same time that the State Board of Health was working on the problem, men engaged in slaughtering knew that the time must come when population would so increase that a change in the way of transacting their business would be needful. Butchers also were being educated up to the point of seeing that their methods were not as good in some respects as those used elsewhere.

⁴ See Report of the Sanitary Committee of the New York Board of Health on the Concentration and Regulation of the Business of Slaughtering Animals in the City of New York (1874), which was the result of this agitation.

In 1870, through the efforts of the citizens of Brighton, an "Act incorporating the Butchers' Slaughtering and Melting Association" was passed by the Massachusetts legislature. By the terms of this act a corporation was formed for the purpose of carrying on the business of buying and slaughtering cattle, sheep, and hogs and of melting and rendering the refuse fat and various ramifications of the work. The capital stock was to consist of \$200,000, divided into lots of \$100 each. The corporation was to obtain a lot of land and erect buildings. Each member of the corporation was to have the right to slaughter on the premises, and the corporation itself was to be allowed to manufacture and sell any of the usual products of such a business, or it could lease the privilege to others. The selection of the land and general methods were under the supervision of the Board of Health. The act further provided that the Board could under certain conditions order any person engaged in the business of slaughtering within 6 miles of Fanueil Hall Market in Boston, to transfer his business to the abattoir in case it was carried on elsewhere in a manner "injurious to the public health."

The passage of this act was bitterly opposed, and it was necessary for the legislature to enact another law in 1871 entitled "An Act Regarding Slaughter Houses and Noxious and Offensive Trades." This act prohibited the establishment or extension of any building for slaughtering or rendering, or for any noxious or offensive trade in any city or town of over 4,000 inhabitants without license, since the mayor and aldermen and the Board could order anyone engaged in the business to desist from it.

Concentration of Slaughtering

After long delays and negotiation between the Board and the butchers, the majority of the latter finally agreed to cooperate with the Board when they realized that the new abattoir would be to their advantage. Thus the Butchers'

Slaughtering and Melting Association came into existence and became a success.

This movement towards concentration of slaughtering, with its effect in improving the quality of dressed meats for the Boston market, was very significant, for it was maturing from 1870 to 1875 and came to fruition in the very years that Gustavus F. Swift, who was to be one of the leading figures in the modern meat packing period, was doing business there in a small way as a cattle dealer and slaughterer. The success of concentration of slaughtering brought to the notice of Swift and others some of the ideas later worked out by the new group of packers on a larger scale for the whole country, since they were able to study there the problems of concentration of cattle and slaughtering and marketing of meats.

Too much has sometimes been made in historical studies of mere coincidences in dates; but it is significant that in the very year G. F. Swift went to Chicago, P. D. Armour also made the headquarters of his already large and well-known pork packing business in the same city, and in that year the report of the secretary of the Chicago Board of Trade stated that "the shipment of dressed beef from this city to the eastern markets has grown within the last few years to a very important traffic."

Beginnings of a Dressed Beef Trade

It should be remembered that dressed beef shipments did not begin with G. F. Swift and P. D. Armour. Some time before this, as has been noted already, G. H. Hammond, an energetic packer, had shipped some dressed beef to eastern markets. There had also developed in 1875 a trade from Kansas City to the East. In the autumn of 1875 Nofsinger and Company of that city sent the first shipment of dressed beef, consisting of the carcasses of 103 head of cattle, two carloads of which were forwarded to Philadelphia and one car to Boston. The rate of freight to Philadelphia was 65

cents per hundredweight, and 75 cents was the charge to Boston.⁵

Meantime, certain cattle dealers and slaughterers in the East saw a chance to increase the profits of their business. G. H. Hammond's experiments in sending beef to Boston and Lowell were known to H. A. Botsford and Company of Hartford, Connecticut. They wrote to Hammond and after some correspondence in 1875, the latter bought and dressed cattle in Chicago for the eastern firm. This continued for some two or three years when the firm sold out, and Hammond made arrangements for the selling of his beef on commission.

One of the men in the Botsford firm, Henry G. Taylor, suggested to Hammond the advantages of having some headquarters near Boston. Finally he located at Worcester and built a warehouse which was opened in August, 1877, on land given by the Boston and Albany Railroad, alongside their station. This was for the purpose of handling exclusively Chicago dressed beef and was the first house of its kind in the United States.

Making a Commercial Success

In spite of this dressed beef traffic, however, the business of shipping dressed beef could not be said to have been a success before the time of G. F. Swift. As Charles Winans has pointed out, powerful interests which shipped live cattle from Chicago to the East and which owned stockyards at Cleveland, Buffalo, Albany, Pittsburgh, Boston, and other places were opposed to the development of the dressed beef traffic which would, they foresaw, mean the inevitable decline of cattle shipping.

Although undoubtedly he saw the possibilities in the dressed beef trade, G. F. Swift did not engage in it at once.

⁵ First Annual Report U. S. Bureau of Animal Industry (1884), p. 265. From 1875 to 1879 Nofsinger and Company shipped dressed beef to Chicago, St. Louis, Baltimore, Philadelphia, Boston, and other eastern cities with varied results. The railways advanced their rates from time to time until the firm mentioned was forced to stop its shipments of dressed beef.

Winans tells an interesting, but totally imaginative story about G. F. Swift talking over the shipping of dressed beef to eastern markets with Herbert Barnes of New Haven in 1875, as they sat on a fence in the Chicago Stock Yards, and convincing him that dressed beef could be sent to the Atlantic seaboard with the use of refrigerator cars, arriving in as good condition as when it left Chicago. Swift was to look after the production and transportation, and Barnes the education of the eastern consumer to the fact that western dressed beef was as good as home dressed meats.

The facts of the story seem to be that for the first two years after reaching Chicago Swift was engaged in buying and shipping livestock. It was only in the late fall of 1877 that he began to ship dressed beef. Augustus Hirsh was employed by Swift to try an experiment with dressed beef. He had killed enough beeves to load two National Dispatch box cars. The sides of beef were suspended from an improvised rack made of two-by-fours and cross-pieces, a rather crude contrivance. These two cars were not iced. So the doors were opened about a foot for ventilation and refrigeration. Hirsh always related with pride that he had the honor of taking these two cars of beef along with his cattle on this pioneering expedition to the East.⁶ This winter shipment was successful, and from it dates the remarkable episode, as yet unwritten, of the fight to get dressed beef into the markets of the country.

Dressed Beef in New England

It was quite natural that G. F. Swift should first try to introduce dressed beef into his native New England where he was known, and that he should rely on the co-operation of his younger brother, E. C. Swift, in this commercial struggle. So "G. F." shipped his beef at first to Clinton, Massachusetts, where "E. C." had a butcher shop and slaughtering business.

⁶ This story was told by A. Hirsh at his ranch in Sheridan, Oregon, to M. G. Midgah, head of the branch house department of Swift and Company.

But "E. C." did not have room enough in Clinton to store the beef, so he sold part of it, as it came in, to neighboring towns, such as Fitchburg, in competition with the local butchers. In a short time another brother, William Swift, was put in charge in Fitchburg.

In order to have his beef running continuously to the East, G. F. Swift determined to make shipments in such a way as to preserve it in better condition; and to send it by regular routes. The Michigan Central had been carrying some dressed beef, but it was insignificant in amount, and as the railroad officials were unfriendly to the business, they increased the rates to make it unprofitable.

The employees of the railroads also neglected to supply the cars with ice while in transit, and the beef would frequently reach its destination in bad condition. Delays in transportation also were disastrous.

Packers Forced to Build Cars

G. F. Swift showed his keen business sense by approaching the Grand Trunk Railroad, which did not handle much live-stock on account of its roundabout route, and was, therefore, not opposed to the development of the dressed beef traffic, to handle the cars for Swift and Company. After negotiating with this railroad, Swift found it would handle his beef, but that he himself would have to furnish the refrigerator cars. Although this arrangement would involve a great expenditure of money at a time when he had but little working capital, he had no alternative but to build the cars himself, if there was to be carried out what Dr. Weld calls "the gigantic project of developing an extensive market for dressed beef in the East."⁷

The accomplishment of this project by Swift and other competing packers took some ten or twelve years. In many places, including such cities as Boston, the dressed beef was

⁷ Weld, L. D. H., *Private Freight Cars and American Railways*, p. 17.

introduced by sale at auction to demonstrate its good quality.⁸ Besides, at nearly all places western meat of equal quality sold at $\frac{1}{2}$ to 1 cent a pound lower than did home fresh killed beef.

The brothers, G. F. Swift and E. C. Swift, spent much time visiting local slaughterers and butchers throughout the East, urging them to give western dressed beef a trial. At the same time G. F. Swift's policy was not combative, but co-operative. He still shipped live cattle, even sending to those who also handled some of his dressed beef.

Partnerships with Local Slaughterers

In some towns, such as Lowell, Fitchburg, Fall River, Worcester, Massachusetts; Providence, Rhode Island; New London, New Haven, New Britain, Connecticut; Paterson, New Jersey; Philadelphia, Washington, Pittsburgh, and Rochester, Swift endeavored to win the most important man in the business. The local slaughterer in New England and other eastern towns was usually a man of importance in the community, because the business required considerable capital to finance plants and supplies of raw materials. The plants were often the biggest things in the town, next to the mills. For the introduction of dressed beef nothing could have been shrewder than Swift's policy, for by the time the chief slaughterer was won over there was already a clientele trade and capital to finance the local business.

This alliance with business already established brought success. The usual method was to form a partnership in which the local slaughterer, G. F. and E. C. Swift each held one-third interest, which incidentally gave the Swifts control.

⁸ The details of this are interesting. "The proposed sale of western dressed heef by auction in the Boston market is taking definite shape and the enterprise will probably be inaugurated at once. The plan is to sell the heef directly from the refrigerator cars at or in the vicinity of the depots shortly after arrival. Certain hours will be fixed for the sale on each day which may be most convenient for the consumer or provision dealers to attend. It is proposed to sell the beef in pieces small enough to suit families so that the profit of the middleman or dealer may be saved to whomsoever cares to do his marketing in that way. But in any event, when the beef is sold direct from the cars to the provision dealers throughout the city who now have to go down to market for it, there will be a considerable saving in expense and Bostonians can get cheaper beef." (Quoted by the *Cincinnati Price Current* [March 19, 1885], Vol. XLII, No. 12, from the *New England Grocer*.)

Some partnerships were on a fifty-fifty basis. The meat was consigned to these partners throughout the East, and they received commissions, in some cases 40 cents a hundred, in others 50 cents a hundred pounds. There were a great many of these partnership arrangements. In addition, there were a few straight consignee arrangements, as in Paterson, New Jersey. Swift's business extended rapidly from north to south, along the Atlantic seaboard. On September 3, 1879, the first car of dressed beef was received by Hyde, Wheeler and Company, commission merchants at 41 North Market Street, Boston.⁹ In Springfield, Massachusetts, George Nye and Company shortly began to handle dressed meat. In Providence, Rhode Island, in 1881, Edwin Tetlow and Company started business for G. F. Swift.¹⁰ By 1882 Washington and Baltimore were added to the list.¹¹

Armour Adds Dressed Beef to Pork Trade

During these years P. D. Armour also had become interested in dressed beef. Prior to the advent of the dressed beef trade he had been a pork packer and had built up his business which was known all over the world. He had, of course, slaughtered and dressed cattle for local use. He was shipping pork and cured hog products to the New York and Boston markets, but with his keen business insight he saw the significance of the dressed beef trade and realized that he must be in a position to offer diversified products to fit in with his pork provision shipments. His already nation-wide distribution system could thus be utilized to better advantage. Devising a car, he sent his first shipment east to Boston. This market had been held by Hammond because he controlled by special arrangements beef shipments by freight over the Michigan Central, New York Central, and the Boston and Albany Rail-

⁹ *The National Provisioner* (Nov. 7, 1908), Vol. XXXIX, No. 19, p. 19. L. B. Noyes, President of T. H. Wheeler Company, corroborates this.

¹⁰ Letter of G. F. Swift to Edwin Tetlow, October 17, 1881. The spirit of co-operation rather than combativeness in introducing dressed beef is shown in these letters.

¹¹ *The Cincinnati Price Current* (Oct. 5, 1882), Vol. XXXIX, No. 40.



Figure 13. Dressed Beef in Cooler

roads.¹² Later G. F. Swift had entered that market in New England by way of the Grand Trunk.

P. D. Armour adopted a more centralized policy than did G. F. Swift in introducing dressed beef into the eastern markets. This was quite natural, for Armour already had his own distributing agencies. Both Armour and Morris discovered, as did Swift later, that local consignee arrangements at best are temporary. With a second generation it was hard to maintain continuity in policy, for there was often a lack of interest, lack of business ability, and financial troubles. Armour established branch houses, or selling agencies under a salaried manager. In that way a permanent policy and institution was set going.

Fight to Establish Dressed Beef

The fight to get dressed beef into the markets of the country lasted until about 1890, and was as bitter a one as commercial history records. The railroad interests were opposed to it and tried to prevent it from increasing; the public in the East was prejudiced against the chilled meat, considering it to be unhealthy and unfit for food and believing it had to be treated with chemicals when shipped long distances; and lastly, the local butchers throughout the country fought this new dressed beef traffic in all possible ways—by boycott, press propaganda, federal government investigations, and state legislation. It is this significant struggle which is worthy of special attention.

The first opposition encountered by the sponsors of the dressed beef trade was when the progressive packers asked the railroads to furnish refrigerator cars, which they refused to do. The railroads considered the refrigerator car to be a speculation. The construction of the car was expensive, and even if fresh meat could be shipped successfully, there was no cer-

¹² *The National Provisioner* (Feb. 6, 1904), Vol. XXX, No. 6. Also *Official Journal of A. M. C. & B. W. N. A.*, No. 8 (May, 1904), pp. 110, 111.

tainty that the volume of traffic which would arise would warrant the capital outlay needed. It was generally supposed at this early date that in warm weather a refrigerator car would be unsuccessful, and that even if the time during which fresh meats could be transported was enlarged, it would still not be a year-round freight movement. Furthermore, the railroads at this time were going through the greatest period of extension in their history, and probably were not interested in investing in expensive and experimental equipment.

Railroads Oppose Refrigerator Cars

The railroads had reasons to discourage the business of shipping dressed meat, as they then enjoyed a lucrative traffic in live animals and were well equipped to handle this class of business. A stock car was more advantageous for the railroad to own than was a refrigerator car, for when not in use to transport stock, it could be and often was used for other freight. The refrigerator car is not adapted for general traffic, as will later be explained more fully. An additional consideration with the railroads was that the dressed carcass of a steer is less than 55 per cent of the weight of the live animal. At that time, besides the dressed meat, little except hides and fats, constituting about 10 per cent of the live weight, was used. The remaining 35 per cent or more was the waste material which was disposed of near the place of slaughtering. Thus if the railroads were to ship only the dressed meat, hides, and fats, instead of the live animals, they would lose a great amount of tonnage, which they would have transported.

A further reason for the railroads' reluctance to encourage the shipments of fresh meats is found in the influence of the various interests engaged in businesses coincident to shipment of livestock. Among these were powerful cattle shippers, who owned and operated loading docks and feeding stations on the lines of the carriers. Some of these stations were also owned by the carriers themselves, and in furthering the ship-

ment of dressed beef they would destroy the utility of property in which they themselves had money invested.

Railroad Interests in Stockyards

The war between the shippers of live cattle and the shippers of dressed beef from Chicago to the East, was largely an attempt of the Vanderbilt lines and Pennsylvania Railroad, which were heavily interested in great stockyards, to sustain those paying properties along their trunk lines.¹³ Thus being equipped for livestock traffic, these roads were allied with the livestock shippers. On the other hand, the Baltimore and Ohio and the Grand Trunk, which were confining themselves to the carrying trade and had no investment in stockyards, were quite willing to afford transportation to shippers of dressed beef.

The livestock men ran western rates up on dressed beef so that they could compete successfully in New York, Philadelphia, and Baltimore with beef dressed in Chicago, or Kansas City, and taken east. For example, in the spring of 1886 the rates on dressed beef were increased.¹⁴ It was urged by the railroads that dressed beef should pay a somewhat higher rate per car than live cattle, because when cattle were slaughtered in the West the valuable parts of more cattle could be shipped in a car than could possibly be shipped if the animals were sent alive. So at the same rates per car the shippers of dressed beef would get their cattle to market at a much cheaper rate than the shippers of live cattle. As the same cattle would have to go in any case alive if not dressed, the railroads concluded to establish such a difference in rate as would give them about the same net income from the traffic and at the same time let the shippers send the beef east as they wished.¹⁵

¹³ *Cincinnati Price Current* (Mar. 11, 1886), Vol. XLIII, No. 10; also *Breeders' Gazette* (Apr. 9, 1883), Vol. III, No. 16.

¹⁴ Armour and Company entered a strong protest to this action and G. F. Swift contributed an article to a Chicago paper opposing the discrimination against the dressed beef industry on the part of the railroads. The Illinois Railroad and Warehouse Commission met in Chicago to investigate the discrimination against the dressed beef industry. (Taylor, *History of Chicago Board of Trade*, Vol. II, p. 729.)

¹⁵ *Breeders' Gazette* (Apr. 1, 1886), Vol. IX, No. 13.

The proportional charges on dressed beef as compared with those on livestock had been 64-40. It was proposed to advance them to 77-40.

The trouble was that there was a tendency to overcharge the dressed beef, in comparison with live cattle, though the railroads proper did not make much after the exorbitant charges for feeding and watering in transit. In this fight, however, the future was with the dressed beef, which had a strong case and was bound to win, irrespective of railroad rebates which later it was able to get. The trade was made a success before it was in a position to ask for or receive rebates. When possible, however, rebates were obtained as a matter of course, for that was the custom of all business in those days.

Adjusting Cattle and Dressed Beef Rates

In order to ascertain to what extent complaints made by shippers of dressed beef regarding exorbitant rates were true, and to arrive at a correct relative adjustment of rates of transportation that would not unjustly discriminate against either traffic, a committee investigated the matter. A conference was held in New York, April 11 and 12, 1883, between the Trunk Line Executive Committee, the Chicago Committee, and dressed beef and livestock shippers, regarding the relative cost of shipping dressed beef and livestock from the West to the seaboard. Certain questions were considered as follows:

1. What proportion does the dressed beef bear to the gross weight of the live steer from which it is obtained when the animal is slaughtered in Chicago?
2. If such steers were brought alive to New York, what proportion would the dressed beef obtained from it at New York bear to the Chicago live weight?
3. What is the exact cost of bringing livestock from Chicago to New York in addition to freight charges?
4. What is the exact cost of bringing dressed beef from Chicago to New York, in addition to freight charges including icing and attendance at icing stations, allowing shrinkage, if any?
5. What are the products of the animal other than dressed beef? Specify each product (including hides, hoofs, tongues,

hearts, offal, etc.), giving separately the approximate weights and also the market value of each both at Chicago and New York.

6. What products of the animal other than dressed beef, are shipped from Chicago to New York and marketed in New York at a higher price than they would bring in Chicago; how much higher? also show what portion of the products is not worth more at New York than at Chicago?

In his report on the whole rate question Commissioner Fink stated that if the rate on livestock was 40 cents per hundred pounds, the two opinions were that the rate on dressed beef should be 70 to 86¾ (an average of 78⅜ cents) per hundred pounds. Finally the matter was left to three arbitrators, G. F. Swift, S. W. Allerton, and Judge T. M. Cooley of Ann Arbor, Michigan. It was provided that the award of two of the three arbitrators should govern, and in the event of such a disagreement that no members of the board shared the same opinion, Judge Cooley should act as umpire and his decision was to be final.

The Cooley Award

The result was the noted "Cooley award," which became the basis of the future rate structure. The underlying principle was to charge each interest for the transportation of its freight a sum proportioned to the value of the service, arriving at the value by comparison of market values in New York on lots of live cattle, which were identical in value in Chicago, but delivered the one as livestock and the other as dressed beef in New York, allowing to each shipper the cost of transportation exclusive of railroad charges and inclusive of any loss from shrinkage. Working from this principle the Cooley award stated that the proportional charges should be 70 to 40 cents per hundred pounds. Yet even after the Cooley award, in the spring of 1886, the rates on dressed beef were increased by Commissioner Fink.

Public Prejudice Against Dressed Beef

The second opposition the dressed beef trade had to face and overcome was the vague, but very real prejudice on the part of the consuming public that the western dressed beef was unhealthy. Many butchers in order to sell their meat would display signs, "We use only city dressed meat," or "City dressed beef only," even when they were actually selling western dressed beef. To those butchers who bought Chicago dressed beef it had to be delivered before daylight, so that their customers would not know of it. People would apologize to guests at dinner for having western dressed beef, saying that the butcher was all out of city dressed beef. In consequence, for years western beef sold for a cent or two a pound lower than did eastern beef. Only after several years did people come to realize that meat ought to be kept awhile before it was eaten, and that by the time beef reached Philadelphia from Chicago, that is in four or five days, it was just ripe for eating.

This prejudice, which was widespread on the part of the public, was kept up by the tactics of the butchers throughout the country. They formed butchers' protective associations and retail butchers' associations, and some of them even employed field secretaries to keep the prejudice alive. The fight against dressed beef, however, was merely sporadic for several years and it was only in the middle eighties, when its phenomenal growth was beginning to be realized, that organizations were formed, both state and national, to keep it out. Certain periodicals were established, such as the *Butcher's Advocate* in New York, to discredit the dressed beef interests.

National Butchers' Protective Association

Finally, in May, 1886, there assembled in St. Louis, Missouri, a convention¹⁶ of the new organization, "The Butchers' National Protective Association of the United States of

¹⁶ Sen. Reports, 1st Sess., 51 Cong. (1889-1890), Vol. III, No. 829, p. 150. (Vest Report.)

America." It adopted a constitution and by-laws, of which Article II, states the object of the association as follows:

The object of this association is to unite in one brotherhood all butchers and persons engaged in dealing in butchers' stock within the states and territories of the United States of America for the following purposes to wit:

First: To protect their common interests and those of the general public in the matter of dealing in slaughtering, handling and selling butchers' stock and fresh meat designed for human food, and to see that such stock be so slaughtered and flesh so handled as to secure the highest sanitary conditions therefor for human food.

Second: To oppose by the whole power and influence of this association the policy and action of all persons and organizations which disregard the public good, and endanger the health of the people by selling for human food diseased, tainted or otherwise unwholesome meat.

Third: To oppose all monopolies and combinations which ultimately injure and oppress the people by controlling and manipulating the market in a staple and indispensable article of human food.

Fourth: To elevate the business to a standard commensurate with its importance to the general public.

The purpose of these organizations was to destroy the dressed meat industry, which was shipping meat from Chicago to eastern cities and selling it for less than the meat killed and dressed by the local butchers. As was stated by the *Cincinnati Price Current*, in indorsing the stand of the *Chicago Journal*:

The convention sought to turn back the wheels of enterprise and progress. If a convention of old time sickle manufacturers should be held to protest against the manufacture of reaping machines that would resemble that of the butchers, who are trying to "down" the dressed beef industry. The shipment of dressed beef from the west to the east is one of the improvements which has blessed the people of this age. It will live in spite of protests and of strikers and boycotts and conspirators of all classes.¹⁷

¹⁷ *Cincinnati Price Current* (June 3, 1886), Vol. XLIII, No. 22.

Struggle at Akron Typical

As an example of a situation which was widespread, the case of Akron, Ohio, may be considered in detail. Thirty miles south of Cleveland, it had in the middle eighties a population of 30,000, mostly factory operatives. In 1887 the workers organized into 22 labor organizations which centered in one labor congress—the Trades and Labor Assembly. This assembly, in alliance with the local butchers, passed a resolution to patronize no butcher in the city, who after due notice persisted in buying meat from Armour and Company of Chicago. Armour prepared to open meat markets and the fight was on. Meat was selling normally at $6\frac{1}{2}$ to 7 cents a pound. Two retail markets which were opened by Armour sold at 3 to $12\frac{1}{2}$ cents per pound. The best meats were to be had, and crowds patronized the shops, while the 60 butchers were doing nothing. The people of the city were opposed to their local butchers. The fight was over in a week, and the Butchers' Protective Association of Akron agreed that its members would buy dressed beef from Armour and Company, in consideration of which action Armour and Company agreed to close the retail markets.¹⁸

In this fight against the Armour dressed beef innovation the Akron butchers appealed to the farmers to back them, on the ground that the triumph of dressed beef would greatly injure the home producers. The Summit County Pomona Grange at its session discussed the matter under the proposition "In their contest with Armour are the Akron butchers entitled to the sympathy of the meat producers, and meat consumers of the country?" It was clearly shown that the Akron butchers had a combination to keep the price down to the lowest point, the agreement being to buy where they could secure the lowest price, even of Armour and Company themselves. This drove the meat producers of the county to other

¹⁸ See Reports of 1st Sess., 51st Con. (1889-1890), Vol. III, No. 829, p. 145. (Vest Report.)

markets, and they cleared a large percentage by going to Cleveland, where the Armour dressed meats were sold openly. Akron butchers, while buying at the lowest figures, were retailing meats at exorbitant prices, and hence no advantage was secured by consumers. The farmers decided they could not lend their sympathies to the butchers.¹⁹

Yet it must be realized that many of the butchers were perfectly sincere in thinking dressed beef a less desirable article. The first shipments were often frozen as hard as a rock and had to be thawed out.

Legislative Methods Against Dressed Beef

Finding even national associations unable to cope with the extension of dressed beef, the butchers turned to legislative methods. As a result of their efforts, together with those of the livestock producers and railroads, there were introduced into the legislatures of Pennsylvania, Vermont, Ohio, Kansas, Missouri, Colorado, and other states, various bills whose object was to prevent the sale in those states of the dressed beef shipped from outside each state. They declared that all meat intended for sale over the block, must be passed upon before slaughter by the inspectors of the particular state. In some states these bills became laws, especially in those states where farmers' representatives were present in large numbers in the legislature, but in some states, as, for example, Vermont, the bills were lost in committee when the facts were presented.

For it was demonstrated that the marketing of cattle in the shape of dressed beef had several advantages, which had enabled the business to grow to great proportions, and to which cattle growers and butchers would sooner or later have to conform. The cattle could be slaughtered in a wholesale way, every particle of offal utilized, meat sent to market cheaper, and as a rule, in as good if not better condition than on foot, with less shrinkage and a better distribution of the different

¹⁹ *Breeders' Gazette* (June 9, 1887), Vol. XI, No. 23.

parts of the carcass where they met the readiest sale. These were substantial advantages, which reduced the cost between producer and consumer and contributed to the benefit of both. It was to the advantage of the cattle grower that the consumer should be able to buy his beef at as slight an advance as possible over the price which the farmer received.

Chicago Board of Trade Favored Dressed Beef

The situation became so menacing through the passage of several laws that the directors of the Chicago Board of Trade adopted the following preamble and resolution :

WHEREAS: Bills have been introduced into legislatures of Pennsylvania, Ohio, Kansas and Colorado, and other states; and

WHEREAS: Said bills are all designed to exclude from sale in such states dressed beef, hogs, sheep, green hams, shoulders, bellies, etc., and

WHEREAS: The success of these bills in the state followed by others would irretrievably embarrass and ruin the dressed beef industry; be it

RESOLVED: That we take pride in the industry, energy and economy of our citizens who have built up in a few years a trade in dressed beef, hog, and kindred products, of remarkable magnitude, expending millions of dollars here annually for labor and materials, and also in the fact that their enterprise has greatly cheapened the price of beef to the whole country; and

RESOLVED: That we earnestly protest against any spread of legislation of this kind levelled against a manufactured product of this state, as being unwarranted and without precedent, and calculated to provoke retaliation; and

RESOLVED: That from the testimony of our city and State Boards of Health and also from the recently published and convincing statement of *Elmer Washburn*, Supt. of Union Stock Yards, Chicago, we believe in no place in the United States is such care and vigilance exercised in inspection of cattle before and after slaughter.

RESOLVED: That the pretense that dressed meats are diseased, advanced by adherents of these bills, is a sham: that the sole purpose and design is to cripple and impair one of the great industrial enterprises of the country, and the false

charges made by the supporters of such legislation will injure the reputation of our meat products at home and abroad and damage the cattle raising industry of the entire country.

RESOLVED: That a copy of these resolutions be sent to every member of the legislatures before which bills are or may be pending.²⁰

Similar resolutions were adopted by the Live Stock Exchange. In these it was declared that the laws against the dressed beef traffic were unconstitutional.

State Laws vs. Dressed Beef Set Aside

The matter of the constitutionality of the state laws was decided in a case in Minnesota, where a Duluth local manager was arrested, tried, and fined \$50 for offering for sale dressed beef from the Armour Packing Company of Kansas City. The case came before the district court, and Judges Ensign and Stearns united in their decision, of which the main points were:

1. Dressed beef is an article of general commerce.
2. Traffic in it as in other articles of commerce can only be regulated by Congress.
3. The Minnesota law was not constitutional and had no standing within the scope of the police regulation of the State from the fact that examination as to wholesomeness was not a feature of the case, notwithstanding the pretense that this law was enacted for the promotion of public health.

The case had another hearing before Judge Blodgett of the United States Circuit Court in Chicago, and the decision of the lower court was confirmed. Finally, the case was carried to the Supreme Court of the United States, which upheld the previous decisions that the Minnesota law was unconstitutional by its interference with interstate commerce.

Even after this victory for the dressed beef interests, the opposition took other forms. For example, in the legislature of Illinois was introduced a bill for state regulation of the stockyards.

²⁰ *Cincinnati Price Current* (Jan. 31, 1889), Vol. XLVI, No. 5.

Last Legislative Attempts

The cattlemen and butchers tried still another plan, originated, it seems, by Frank E. Gillett, a state senator of Kansas. As a result Governor Humphrey of Kansas proposed that a convention of members of legislative bodies of the states interested be held in St. Louis to consider the matter of uniform legislation in regard to the so-called "Beef and Pork Trust," each state to be represented by three senators and five representatives. The states invited to send representatives were Colorado, Texas, Nebraska, Ohio, Kansas, Wyoming, New Mexico, Arizona, Illinois, Missouri, Iowa, Indiana, Arkansas, Wisconsin, and Minnesota.²¹

The convention, consisting of 60 delegates from 9 states, met at St. Louis in March, 1889, and adopted the following resolutions :

WHEREAS: It is commonly asserted and very generally accepted as true, that certain powerful trusts and combinations of corporations and individuals have united and combined for purposes of controlling the market price of cattle, pork, and other products of the country, and have entered into agreements and combinations with railroads for the purpose of centralizing the above named products in Chicago and other large western cities; and

WHEREAS: All such combinations for purposes of centralizing markets and controlling or fixing the price of such production, is contrary to public policy and an injustice to producer and consumer, which should be prohibited by law, and,

WHEREAS: As State laws are inadequate to wholly remedy evils complained of and believing national legislation is demanded to give complete protection to producers and consumers, therefore, be it

RESOLVED: 1. That the Congress of the United States be respectfully requested to pass a law defining such combinations or trusts as unlawful and prohibiting them under adequate penalties, when interstate commerce is affected by such unlawful combinations or trusts.

²¹ *Cincinnati Price Current* (Feb. 14, 1889), Vol. XLVI, No. 7.

2. That the Interstate Commerce law for control of railroads be so amended that it will work in harmony with a law as above requested.

The Legislative Committee of this convention also submitted a form for uniform state legislation in regard to inspection before slaughter of cattle, sheep, and swine designed for slaughter for human food.

While the convention was without authority to enforce its wishes, it served to show the sentiment among producers and butchers regarding the increasing popularity of the dressed beef trade, and had a good deal to do with the appointment of a committee of the United States Senate to "examine fully all questions touching the meat products of the United States; and especially as to the transportation of beef and beef cattle and the sale of same," and in general to investigate the "Beef Trust" and its alleged relation to depressed prices of livestock.²²

Dressed Beef Won on Merit

At this point it is sufficient to take up the statement that the dressed beef trade was built up through unjust depression of prices. The subject was well considered in an article in the *Breeders' Gazette* in 1888.²³ The price of livestock had declined, but the *Gazette* held that it was not reasonable, as the butchers' associations declared, that the price to the consumers had been kept at the old rates. The reverse was really the case. With the low price of cattle which had prevailed for some time, and of which all buyers could take equal advantage, it was pointed out that the condition of the butchering interests would be a most prosperous one if only the old rates to consumers still prevailed, but it was clear in 1888 that the

²² Senate Reports, 51st Cong., 1st Session, Report No. 829. The position taken by the range cattlemen is interesting, especially because based on a wrong premise. The matter was the subject of an article in the *Breeders' Gazette* (June 2, 1887), Vol. XI, No. 22.

²³ "The Dressed Beef Industry as a Factor in the Present Situation," *Breeders' Gazette* (June 6, 1888), Vol. XIII, No. 23.

butcher trade was in a bad way, and that their business in many centers had been largely won by the dressed beef men. This was possible, because the latter could undersell the butchers, and, therefore, could command the trade of the public.

This leads to a clearer conception of the nature and causes of the depression in the late eighties which stamped the cattle markets throughout the country. The cause of the difficulty lay, not so much in the nature of combination, but very largely in an unusual competition, different from that which the market had previously known. Under the old system the butchers enjoyed a large measure of profit, which they appeared in no wise anxious to abridge by reducing the prices of meats to consumers, and any competition between them was purely local in its operations and temporary in its duration, while they were so numerous and their needs so imperative that the competition between them in the principal cattle markets had a tendency to steady and sustain values. All the tendencies and influences surrounding the market were then in favor of the producers.

With the growth of the dressed beef trade, however, all this was changed. The large margin of profits of the local butchers presented an opportunity for this trade to gain a foothold, for those engaged in it were doing business on a larger scale than the butchers, and did not need such wide margins to render their business profitable. During the transition from local slaughtering to the final victory of dressed beef in the markets of the country, the market suffered from the competing interests of middlemen, which were adverse to those of the producers. The whole tendency of the struggle lay in the direction of lower prices to the consumer, for it was to the interest of both butcher and the dressed beef men to cheapen beef to consumers to the last degree in order to extend their trade.

Nature Brought Victory to Dressed Beef

At the very time that the fight against dressed beef was at the climax of intensity, a natural phenomenon did much to give it the victory. That was the failure of the ice crop in the winter of 1889 and 1890. A great many butchers the country over, who had stood out against Chicago dressed beef up to that year, then began to experiment fairly with it. They found it too great an expense to handle meats of their own slaughter and hence a marked increase was seen in the total dressed beef trade.²⁴

Finally by 1894 one notes the complete triumph of dressed beef. It is true the ninth session of the Butchers' National Protective Association was held in that year, but there were only 65 delegates, a meager representation of some 100,000 butchers in the United States.²⁵ On the other hand, however, the *Butchers' Advocate*, which had started in New York City some years before to fight dressed beef, declared frankly in its issue of November 21, 1894, that:

Western dressed beef has completely captured New England. The most expert and experienced butchers concede it is an impossibility to kill native steers and compete in price with the imported article. When the fact is shown the observer by careful mathematical computations he begins to appreciate the commercial genius of the men who can kill cattle in far western points, lay the carcass down at the most remote New England crossroads and sell at prices lower than the bare cost of raising and killing the native animal.²⁶

²⁴ *Cincinnati Price Current* (June 26, 1890), Vol. LXVII, No. 26. See also *Breeders' Gazette* (1889), Vol. XVI, No. 1, article by John Clay.

²⁵ *The National Provisioner* (June 16, 1894), Vol. IX, No. 24.

²⁶ *Butchers' Advocate* (Nov. 21, 1894). Vol. XVIII, No. 1.

CHAPTER XII

PRESENT ASPECTS OF AMERICAN BEEF TRADE¹

United States Greatest Beef Producer

As a producer of beef, the United States leads the world. The census of January 1, 1920, reported 66,652,559 cattle, of which 35,424,458 were beef animals. These exceeded the nearest competitive beef country by 44 per cent. For the present the relative figures on cattle, including milk and draft animals as well as beef, were given as follows by the United States Department of Agriculture:

COUNTRIES	NUMBER CATTLE
India.....	142,567,000
United States.....	66,653,000
Brazil.....	37,500,000
Argentina.....	27,392,000
Germany.....	16,904,000
France.....	12,374,000
Australia.....	11,040,000
Canada.....	9,477,000
Uruguay.....	7,803,000

Not all these countries are meat-surplus countries, however, as many of them consume more than they produce. The eight principal meat export countries are Argentina, the United States, Australia, Uruguay, New Zealand, Brazil, Canada, and the Union of South Africa.

Cattle also are the only class of livestock that has gained in numbers as compared with pre-war conditions. The International Institute of Agriculture reports a general increase of about 19,000,000 head in the world as a whole, as compared

¹ Based upon an article by H. V. Munnecke, "Trends in the American Beef Trade," *The Producer*, July, 1922.

with a decrease of 27,700,000 sheep and 3,000,000 swine. Certainly these figures would not provide a foundation for the oft-repeated prediction of a world shortage of beef. It may be said, however, that the statement above made is open to doubt. Although no exact figures are available for the world as a whole, the countries from which we have reliable recent statistics show a decrease of approximately 7,000,000 head in the total number of cattle as compared with pre-war conditions, of 97,000,000 sheep, and of 19,000,000 swine.

Beef Exports Diminishing

Nevertheless, the general beef trade has changed considerably in this period. During the war the laboring classes in many countries gradually changed their standards of living to a higher level, with a resulting increase in the demands for animal products. To offset this, the widespread unemployment tends to decrease consumption and to limit foreign trade. The war raised to unprecedented levels the imports of beef products by the Allies, but current statistics show a strong tendency for these imports to recede to a point not much above that of the pre-war period. Thus the United Kingdom imported 1,362,693,584 pounds of beef in 1921, as compared with 1,108,921,184 pounds in 1913. Similarly, France increased her beef imports from 5,165,228 pounds in 1913 to 294,944,661 pounds in 1920, but for 1921 her beef imports dropped to something over 120,000,000 pounds. Italy's experience has been much the same as that of France, while Germany's beef imports in late 1921 were only about a third of those at the corresponding time in 1913.

In 1920 American exports of beef were nearly four times as large as in 1913, but in 1921 they had almost returned to the pre-war level. During the 5 years, 1910-1914, the average exports of beef from the United States totaled 80,000,000 pounds, while during the 5 years, 1915-1919, the average exports were 421,000,000 pounds—an increase of approxi-

mately 526 per cent. In the last 15 years, according to the Department of Agriculture, we have exported the following percentages of our annual beef crop:

YEAR	PER CENT	YEAR	PER CENT	YEAR	PER CENT
1907.....	4.80	1912.....	0.86	1917.....	5.62
1908.....	3.41	1913.....	0.79	1918.....	9.53
1909.....	2.03	1914.....	1.68	1919.....	4.78
1910.....	1.50	1915.....	6.86	1920.....	2.68
1911.....	1.30	1916.....	4.69	1921.....	2.49

Our competing nations in the export trade have had a varied experience. Argentina shows practically no change between 1913 and 1920, while Canada shows a very distinct increase in 1921 over 1914. New Zealand exported nearly double the amount of beef in 1920 that she did in 1913, but much of this consisted of frozen beef accumulated during the war rather than new product. Australia showed decreases for both 1920 and 1921 as compared with 1913.

Per Capita Consumption Declining

Recent figures on the average consumption of beef by different countries are not available. The pre-war per capita consumption of Great Britain for 17 years ranged from 55 to 60 pounds, although in 1920 it had dropped to 25.8 pounds. Canadian pre-war consumption for 10 years ranged from 54 to 61 pounds, while that of Germany ranged from 39 to 45 pounds over a period of equal length. France averaged about 43 pounds in 1904, but her consumption of beef has most certainly decreased since that time. In 1920, Belgian beef consumption totaled 29.5 pounds per capita, while Spanish consumption was only 2.3 pounds. The big meat producing countries are heavy consumers. For example, the consumption of beef in Buenos Aires varied on a per capita basis from 275 pounds in 1911 to 163 pounds in 1916.

American per capita consumption of beef is constantly decreasing. Since federal inspection of slaughter of meats

destined for interstate trade was inaugurated, the per capita consumption of beef has dropped from 79.7 pounds in 1907 to 57.7 pounds in 1921. Accurate figures are not available previous to 1907, but in 1900 the estimated consumption of beef, based on the census, was 79.2 pounds. By using the number of beef cattle per capita back to 1840, as a basis for estimate in relation to recent consumption, the average annual per capita consumption of beef by decades was probably :

DECADE	ESTIMATED CONSUMPTION (Lbs.)
1830-1839.....	75.7
1840-1849.....	79.7
1850-1859.....	85.6
1860-1869.....	73.7
1870-1879.....	77.8
1880-1889.....	87.2
1890-1899.....	88.3
1900-1909.....	76.1
1910-1919.....	64.3
1920-1921.....	57.1

The actual difference in consumption is probably not so great as the figures indicate, since the wastes of beef were much greater previous to 1900. This was due in part to the less perfected state of refrigeration and the handling of meats in the earlier years, as well as to the unusual nature of the cattle slaughtered and the larger amount of trimming required for the different cuts.

Marked Increase of Milk Cattle

Further evidence of this condition lies in the fact that beef consumption through these years has varied less than per capita population of beef cattle. Part of this variation in per capita population of beef cattle has resulted from the differing times of the year when the census was taken, but this does not account for all the difference between beef consumption and per capita beef population. The figures for the respective censuses follow :

YEAR	ALL CATTLE	MILK CATTLE	OTHER CATTLE
1840.....	0.863	.....	.....
1850.....	.765	0.275	0.490
1860.....	.894	.344	.550
1870.....	.717	.287	.430
1880.....	.718	.248	.470
1890.....	.829	.264	.565
1900.....	.887	.225	.662
1910.....	.673	.224	.449
1920.....	.632	.296	.336

Several interesting facts develop in this table. The decrease of the strictly beef cattle ("other cattle") with reference to our population is marked, while the per capita increase of milk cattle shows most definitely during the last decade.

This increase of milk cattle has had a very marked effect on the quality of beef coming to the market. For example, at the markets of Chicago, Milwaukee, and St. Paul approximately 50 per cent of the receipts are animals with dairy characteristics. At Chicago this proportion is not quite equaled, but at Milwaukee and St. Paul it is exceeded. Including all markets, the proportion of cattle of dairy blood probably runs around 30 per cent. Dairy cattle, of course, do not provide a high grade of meat; but the development of the small retail shop in connection with groceries has afforded an outlet for this class of cattle, which has helped the dairy industry, although some hold it has proved extremely detrimental to the production and sale of quality beef.

Relative Rank of Markets

The relative rank of the different markets for 1921 in receipts and slaughter of cattle and calves is shown in the following table:

MARKET	RECEIPTS	SLAUGHTER	PER CENT	SHIPMENTS
			SLAUGHTERED	
Chicago.....	3,539,538	2,236,776	63.2	1,302,762
Kansas City.....	2,469,442	1,199,692	48.5	1,260,750
Omaha.....	1,434,576	797,419	55.5	637,157
St. Louis.....	1,077,260	465,875	43.2	611,385

MARKET	RECEIPTS	PER CENT		
		SLAUGHTER	SLAUGHTERED	SHIPMENTS
St. Paul.....	984,826	563,635	57.2	421,191
Fort Worth.....	983,802	576,203	58.5	407,599
Jersey City.....	843,928	842,754	99.8	1,174
Pittsburgh.....	745,100	174,725	23.4	570,375
Sioux City.....	620,373	273,382	44.1	346,991
Buffalo.....	609,063	166,679	27.3	442,384
St. Joseph.....	558,040	369,883	66.2	188,157
Indianapolis.....	483,097	230,000	47.6	253,097
Denver.....	481,502	121,984	25.3	359,518
Cincinnati.....	453,974	301,620	66.4	152,354
Milwaukee.....	438,720	402,492	91.7	36,228
Oklahoma City....	315,113	202,352	64.2	112,761
New York.....	301,398	299,697	99.4	1,701
Wichita.....	284,815	83,035	29.2	201,780
Baltimore.....	279,333	155,643	55.7	123,690
Cleveland.....	247,835	227,596	91.8	20,242
Louisville.....	246,003	81,036	33.0	164,967
Philadelphia.....	227,035	224,731	99.0	2,304
Lancaster.....	205,297	37,267	18.2	168,030
Detroit.....	200,644	168,448	83.9	32,196
New Orleans.....	187,899	159,600	84.9	28,299
El Paso.....	170,410	23,709	13.9	146,701
San Antonio.....	151,050	35,846	23.1	115,204
Portland.....	119,911	59,056	49.3	60,855
Amarillo.....	113,239	983	0.9	112,256

It is interesting to note in the foregoing table that such markets as Jersey City, New York, Philadelphia, Cleveland, Milwaukee, Detroit, and New Orleans are essentially terminals at which over 80 per cent of the cattle and calves received are slaughtered. On the other hand, Amarillo, El Paso, and Lancaster are essentially points for reshipment—in the latter case for slaughter elsewhere, and in the two former cases for further feeding and development. The great majority of markets occupy intermediate positions, although, in general, each section of the country is characteristic. For example, the two markets of the central region, not included as terminal markets in the foregoing—Chicago and Indianapolis—average slaughtering 61.3 per cent of their receipts. The markets of the Northwest—Omaha, St. Paul, Sioux City, Portland, Den-

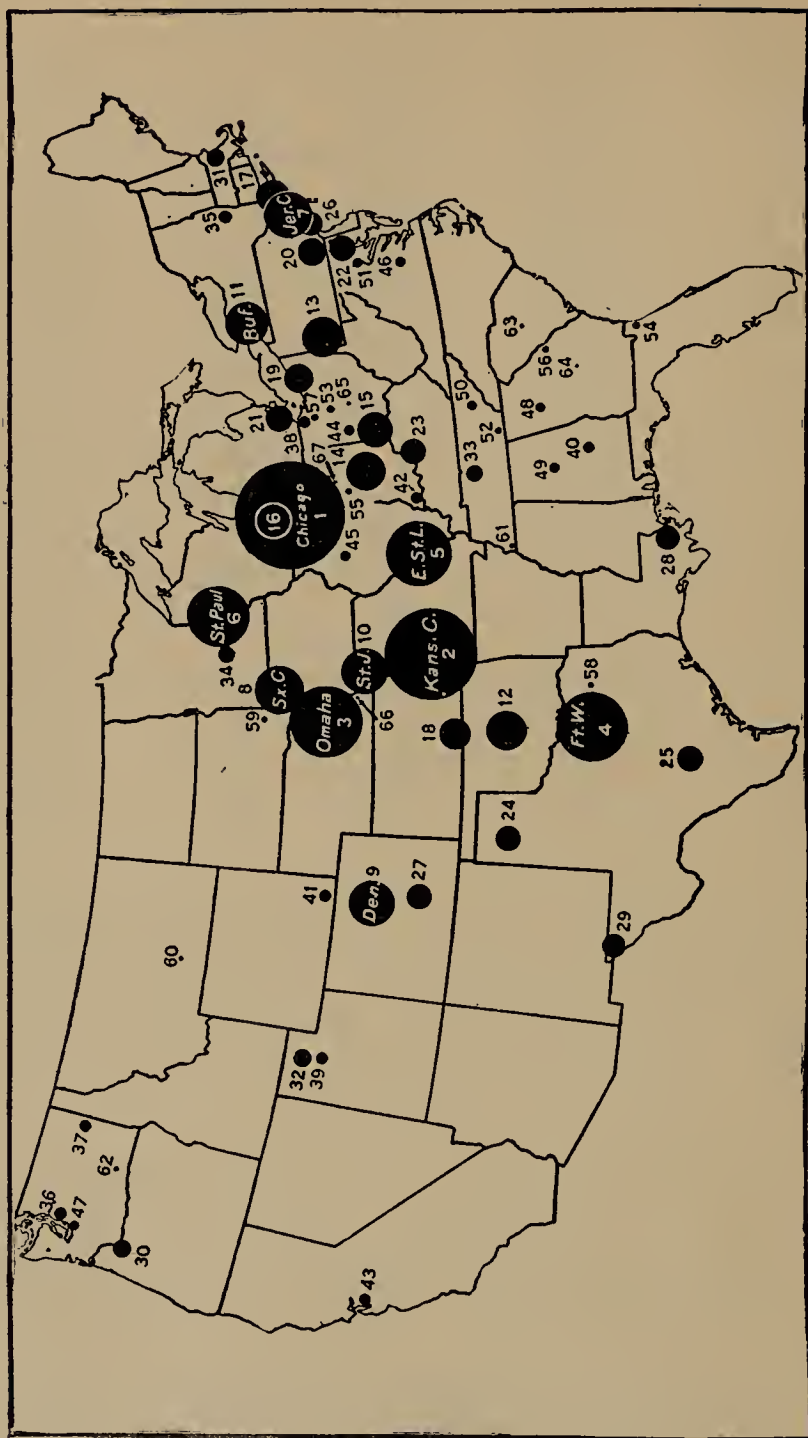


Figure 14. Cattle Markets

Relative size based on average yearly receipts of cattle and calves, 1916-1920. Area of dot varies with number received

ver, and St. Joseph—average slaughtering 49.7 per cent of their receipts. The three markets of the Southeast—St. Louis, Louisville, and Cincinnati—average slaughtering 47.7 per cent of their receipts. The seven markets of the Southwest—Kansas City, Fort Worth, Oklahoma City, Wichita, El Paso, San Antonio, and Amarillo—average slaughtering 47.2 per cent of their receipts; while the four big markets of the East—Pittsburgh, Buffalo, Baltimore, and Lancaster—average slaughtering only 28.1 per cent of their receipts, and really act as forwarding stations for the big terminal markets of the East already listed.

Classification of Cattle

Cattle for immediate slaughter are divided into the two general classes of beef cattle and butcher stock, while cattle to go back to the country are divided into feeders and stockers. Beef cattle comprise beef steers, both native and range, yearling steers, yearling heifers, and heavy heifers. Butcher stock, on the other hand, is composed of cows, bulls, and veal calves. The rate at which these classes of cattle come to market varies with the season of the year. For example, the cattle from the northwest states arrive on the market from the end of July until the end of December; the cattle from the southwest range and from the bluegrass sections begin to run about mid-April and last until July; the cattle from the beet pulp, cottonseed cake, and hull-feeding districts move about a month in advance of these latter cattle; while the eastern-fed cattle (Pennsylvania, West Virginia, and Maryland) move about a month previous to these. The short-fed cattle from the Corn Belt come from the first of November on, while the principal feed-lot run begins about the last of the year and continues until well into June.

Based on the use to which the different classes of cattle are put, one finds thoroughly marked differentials in price. As

possibly most typical of these conditions stands the Chicago market, on which the prices by years ran as follows:

YEAR	NATIVE BEEF	FAT COWS AND HEIFERS	CANNERS AND CUTTERS	VEAL CALVES	RANGE CATTLE	STOCKERS AND FEEDERS
1910.....	\$ 6.80	\$ 4.60	\$3.10	\$ 8.10	\$ 5.40	\$ 4.85
1911.....	6.40	4.35	2.85	7.60	5.65	4.75
1912.....	7.75	5.25	3.40	8.75	7.60	5.70
1913.....	8.25	6.10	4.25	10.10	7.40	7.05
1914.....	8.65	6.55	4.60	9.90	7.65	7.35
1915.....	8.40	6.10	4.25	10.15	7.75	....
1916.....	9.50	6.75	4.80	10.85	8.40	7.20
1917.....	11.60	8.25	6.25	13.75	10.60	8.40
1918.....	14.65	9.50	7.25	15.75	14.50	10.95
1919.....	15.50	10.00	6.45	17.05	11.25	10.85
1920.....	13.30	8.55	5.05	14.90	8.80	8.95
1921.....	8.20	5.40	2.90	9.80	6.15	6.45
Average.	\$9.92	\$6.78	\$4.60	\$11.39	\$8.43	\$7.50

Value of Native Beef

It is popularly believed that the margin between good native beef and butcher stock, or cutters and canners, is constantly narrowing. On the basis of the foregoing statistics this is doubtful, since the following ratios between canners and cutters and native beef, and between fat cows and heifers and native beef, show that the relative value of native beef is actually above that of a dozen years ago:

	1910	1911	1912	1913	1914	1915	1916	1917	1918	1919	1920	1921
Ratio cutters and can- ners to na- tives.....	2.19	2.24	2.27	1.94	1.83	1.97	1.97	1.85	2.02	2.41	2.63	2.82
Ratio fat cows and heifers to natives...	1.47	1.47	1.47	1.35	1.32	1.37	1.41	1.41	1.54	1.55	1.55	1.51

The consuming public has changed its tastes for beef during the development of the beef industry. Today the popular-sized steak is 2 pounds or less, while the 3- to 5-pound roast measures the average family demand. A high proportion of red meat, and smaller cuts, are the two dominant problems that

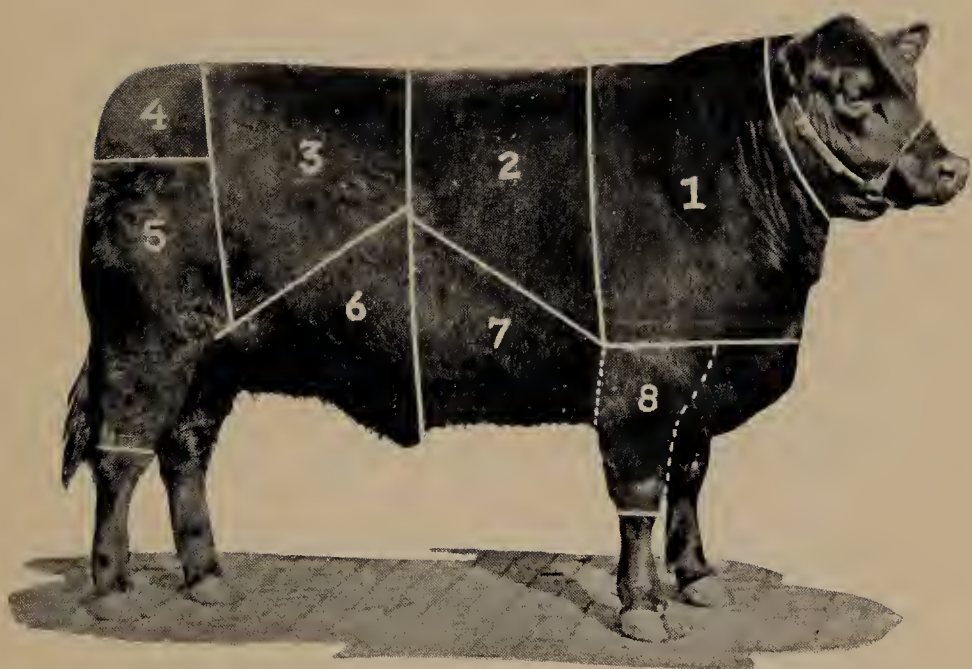


Figure 15. Beef Steer Showing Cuts

- | | |
|----------|---------------|
| 1. Chuck | 5. Round |
| 2. Rib | 6. Flank |
| 3. Loin | 7. Plate |
| 4. Rump | 8. Fore Shank |

today confront the meat retailer. Quality of beef is a predominating factor, and, although there is some recession from the extreme demands for high-priced cuts that followed the war, the trade in ribs and loins still continues to control prices and trends in the entire industry.

Gradation of Carcasses

Carcasses of beef are usually graded as choice, good, medium to good, fair to medium, fair, and plain. The relative proportion of these different grades on the market varies according to the season of the year. During the season in which the receipts are predominantly native cattle—January 1 to July 15—good and choice carcasses total about 10 per cent; medium and medium-to-good carcasses, about 70 per cent; fair-to-medium and fair carcasses, about 15 per cent; and plain carcasses, about 5 per cent. On the other hand, during the season in which the receipts are predominantly grass cattle—July 15 to January 1—the percentage of good carcasses runs about 30; of medium and medium-to-good, 40; of fair-to-medium and fair, 15; and of plain, 5. The grades in the two cases are not exactly equivalent, as good westerns are not equal to medium natives.

In addition to being graded for quality, the carcasses are graded by weight and sex. About 14 per cent of all cattle marketed are cutter and canner cows, while about 40 per cent of the cattle suitable for carcass beef are she-stock. In the steer beef about 40 per cent of the carcasses run over 600 pounds and about 60 per cent under. The demand for the heavier carcasses varies little throughout the year. The markets of the big cities supply the principal trade for them, the sales being largely to hotels, restaurants, dining cars, and clubs that have a standard demand for certain cuts the year round. This natural demand for heavy carcasses takes only about 15 per cent of all the shipper cattle on the market, their live weight being 1,300 pounds and up, and their carcasses making about

750 pounds of beef and up. It is difficult to secure this class of cattle at all seasons of the year, as very few of them come to market between August 1 and February 1, except those furnished for shows and the Christmas trade. From February forward there is usually a sufficiency of this class of cattle, while in late March and April the market may be overcrowded, with a consequent drop in price. On the other hand, in times of scarcity of heavy cattle, buyers having orders for this class of stock make competition so lively that they often bring \$1 to \$2 above their real value as compared with smaller animals of the same grade. It is this class of cattle that has been most provocative of criticism on the part of producers, since a judgment of values based on their prices in times of either scarcity or surplus is certain to mislead the average feeder.

Variations in Requirements

Very few cars of straight lots as bought on the hoof can be sold. Most cars of dressed beef must be made up of assorted lots based on quality, weights, cost, and suitability to the general trade of the region in which the carcasses are to be marketed. Usually 4 or 5 choice carcasses, 5 to 8 medium carcasses, 5 to 8 fair-to-medium carcasses, and 2 to 5 plain carcasses make up an assortment for refrigerator shipment.

The beef requirements of the markets in the different sections of the country vary considerably. The beef trade is largely based upon New York. New York, Jersey City, and the adjacent regions take all grades and classes of beef. The down-town houses of New York City handle a varied assortment, mostly weighty, for the large shops and the hotel and restaurant supply trade. These houses handle almost everything except yearlings. On the other hand, the Hudson River territory to the north of New York demands a greater proportion of medium-to-choice carcasses with lighter weights, while Long Island and the Harlem section of the city constantly demand the best light carcasses available. Up-state

New York and most of Pennsylvania, excepting Philadelphia use the fair-to-medium grades of beef with lighter average weights, as do Delaware and most of New Jersey. Philadelphia takes a general assortment like New York, demanding all grades from plain to choice, but price levels at this market are frequently lower than at New York, except on the good-to-choice carcasses.

New England Demands Heavy Beef

Boston is the market for heavy beef. The carcasses must be strong and well finished, steer beef running from 800 pounds up and cow beef from 600 pounds up. However, for the trade in the surrounding towns and country, Boston affords a good outlet for strictly choice 900-pound live cattle. Boston is really the hub for the entire New England beef trade, although the southern sections of New England vary from the northern and western ones in demanding lighter sides.

Demands Further South

Washington calls for a general assortment of lighter weights, mostly yearlings and heifers in the medium-to-good grades and weighing 400 to 600 pounds. It is a poor market for plain-to-inferior beef, especially grass stock. On the other hand, Baltimore, and Maryland in general, take the fair-to-medium grades in 85 per cent of their shipments, but average rather lower price levels than the districts farther north. Baltimore handles, however, about 15 per cent of good yearlings, with carcasses weighing 500 to 600 pounds.

South of the Potomac and Ohio rivers, and east of the Mississippi, will be found the big market for the southwest range cattle. In certain regions, such as a few of the larger cities and the winter resorts, the demand is increasing for the better cattle from the feed-lots of the North, but up to the present time this demand is rather spotty from a geographical standpoint.

Mid-West Inclines to Lighter Weights

The Mid-West, composed of the east and west North Central states, consumes largely the fair-to-medium grades, with more fed cattle than are included in the Southeast, the Southwest, or the plains and Mountain states. The most desired carcasses for this section weigh from 400 to 600 pounds, but should not be overly fat. The principal cities of this section—Chicago, Milwaukee, St. Louis, Kansas City, and Omaha—with their adjacent selling territories, are relatively uniform in their demands. All classes of beef are sold here, but principally light butcher cattle. These are usually yearling heifers and steers, which go to the shop trade largely, and are medium to choice in quality. The Twin Cities—Minneapolis and St. Paul—are very interesting, due to the difference in their demands despite their proximity. Minneapolis seeks more fed cattle than St. Paul and maintains a better price level. Minneapolis cattle should weigh from 300 to 600 pounds in the carcass, while St. Paul cattle weigh 500 to 700 pounds.

The Far West and Texas

In the West and Northwest the bulk of beef sold comes from grass cattle. There are a few fed cattle in this section and an increasing number of pulp cattle. In general, the consumer's needs in this section are adjusted to supplies from Denver, or a trade parallel to this. On the Pacific Coast the medium grades of cattle also predominate. They are mostly grass-finished and weigh from 600 to 800 pounds on the block.

The Southwest in its general character resembles the mountain and plains region, as far as country trade is concerned. A few of the cities, however—such as Houston, Dallas, Fort Worth, and El Paso—are developing a growing demand for the best choice light-weight yearlings, and each year some of the best show cattle from the International Live-Stock Exposition at Chicago and other winter shows find ready sale at these points.

Kosher Trade an Important Factor

A discussion of beef demand would not be complete without a reference to the Kosher trade. In New York this trade takes the best heavy cattle and the best of the light choice cattle. The greatest percentage of these cattle are steers, although some fat cows and heifers are included. In Chicago the Kosher trade furnishes the best outlet available for heavy steers and cows, all of the cattle being prime in finish and weighty in carcass. Only the forequarters of these cattle go into the Kosher trade, however, and the ribs and loins are cut out to supply the dealers in the hotel, restaurant, and club trade.

Consumption of Beef and Veal

The distinctions in the consumption of beef and veal between different sections of the country are presented by the Department of Agriculture in the "Yearbook" for 1920. The essential facts are presented in the following table:

SECTION	BEEF CONSUMPTION				VEAL CONSUMPTION			
	Urban	% Diet	Rural	% Diet	Urban	% Diet	Rural	% Diet
North Atlantic.....	64.0	38.4	47.1	26.8	13.5	8.09	10.7	3.67
East North Central.....	75.6	42.8	48.3	24.6	11.6	6.56	7.2	2.96
West North Central.....	77.5	42.8	57.4	26.9	11.7	6.43	6.3	1.85
South Atlantic.....	55.1	34.8	28.5	16.5	5.7	3.59	3.2	0.93
South Central.....	66.1	37.1	28.6	15.7	4.4	2.47	1.7	6.74
Western.....	76.2	42.8	64.7	34.4	16.3	9.17	12.7	6.01

The most interesting fact brought out by the above table is that the rural consumption of beef and veal is invariably smaller, both actually and proportionally, than the urban consumption, while the greatest beef consumption occurs in the west North Central and Western states, with the greatest veal consumption in the North Atlantic and Western states.

Demand for Fed Beef Growing

One interesting factor in the modern beef trade is found in the gradually growing demand for fed beef. It is becoming increasingly difficult to market plain or inferior beef, the distinction between today's market and the market of even a

year ago being quite marked. Consumers are willing to pay several dollars per hundredweight more for the carcasses from finished animals than for grass animals. In New York, about June 10, 1922, carcasses from native beef were selling freely at 14 to 16 cents a pound wholesale, while good Texas grass beef was actually begging at $8\frac{1}{2}$ cents. This condition is not extreme, but really measures the trend of modern markets.

The greatest quantity of beef is marketed in the fresh form, although nearly 10 per cent by weight is marketed in the semipermanent forms of frozen beef, cured beef, or canned beef. Roughly speaking, about 3 per cent each is frozen or cured, and about 4 per cent is canned. The American people, as a whole, will not buy frozen carcasses, and most of the meat which is frozen is put in that form temporarily for later manufacture into sausage. However, certain cuts, such as tenderloins and strip loins, are frozen for sale to the hotel and restaurant trade, as are the loins and ribs of prime cattle whenever they come on the market in surplus amounts. Boneless chucks and beef trimmings are frozen for sausage manufacture. Frozen imported beef is confined in its distribution to New York and its adjacent territory. The bulk of this frozen beef goes to ship chandlers and jobbers, and very little goes direct to the consuming trade. As a matter of fact, there is never very much imported frozen beef sold, in terms of the general trade. The livestock for the preparation of cured and canned beef, of course, is found in the cutter and canner grades on the market. It is usually she-stock, although occasionally thin steers of inferior breeding, which are definitely unsuited for the feed-lot, are used for these purposes. The bulk of animals going into this trade are dairy cows.

Veal Calf Popular

The veal trade is based on two general classes of calves: the milk veals, which come from the dairy districts, and the heavy veals, which come off the southwest range, and from the

Corn Belt at certain seasons of the year. During the period from January 1 to June 1 from 80 to 90 per cent of the calves received are true milk veals, but from June on the percentage of heavy calves begins to increase, so that during late September, October, and early November there are large receipts of heavy, common calves. The carcasses of milk veals are usually divided into three grades, which for convenience may be called good to choice, medium, and common. The good-to-choice veals comprise from 10 to 15 per cent of the receipts, the medium veals from 45 to 50 per cent, and the common veals from 35 to 40 per cent. The heavy veals are divided into two grades—those of medium to good and those of common to medium. Each of these grades is again subdivided by weights. For example, the medium-to-good heavy veals are grouped, on the basis of their carcasses, from 90 to 120 pounds, 120 to 140 pounds, 140 to 175 pounds, 175 to 200 pounds, 200 to 250 pounds, and 250 pounds up. Obviously, in the last class the question as to whether an animal is veal or young beef is determined largely by the particular buyer making the purchase and the department handling the animal. The border line here requires arbitrary decisions where arbitrary differences do not exist. The common-to-medium heavy veals are divided into two weights—under and over 120 pounds.

Veal Markets

The milk veals are largely sold in the territory north of the Ohio River and east of the Mississippi. The heavy veals, on the other hand, are largely consumed in the remaining territory. While the South is not a large veal market, certain sections, such as New Orleans, do a thriving business at fairly good price levels. Most of the veals on this market, however, are of the heavier types.

In certain sections the problem is not the heavy veal, however, but rather the immature veal. Certain cities of the East, like New York, have laws specifying the minimum weight of

veal carcasses—e.g., 60 pounds; but in other cities a certain proportion of bob veal and calves under a week reaches the market.

Regions in which there are large foreign settlements usually provide good veal markets. For example, the Jews and the Slavic races, especially the Poles, consume relatively large quantities of veal. The Montana and Colorado mining districts develop strong seasonal demands for veal of medium weight, as do certain of the industrial districts of the Northeast where labor congregates largely by nationalities.

Distribution an Intricate Problem

Successful marketing both of beef and of veal is dependent on a knowledge of the trade demands of each of the different sections of the country, and the selling of each class and grade of beef at the point where it can realize the best price. It frequently happens that steers from the same car-lot purchased on the Chicago market are sold in different states, and realize differences in price as great as \$2 to \$4 per hundred-weight, despite the fact that the carcasses are of the same grade. The distributor attempts, of course, to place his carcasses at the point where the most money will be realized, but it often happens that his supplies would overload his best markets and his surplus must be vended at lower prices. On this account, the price level for cattle of this grade will be lower than if all carcasses could reach the top market. But a distributor is at the same disadvantage if he does not know the characteristics of each regional market, since he cannot pay the prices for cattle which his competitor who knows the markets does, and his business is consequently restricted. It is because of their acquaintance with, and ability to supply, these regional demands that certain firms in the packing industry have developed nation-wide businesses instead of local businesses, because such companies as can reach understandingly these better markets can provide better prices for the producer and build greater volumes of trade.

CHAPTER XIII

GROWTH OF AMERICAN MEAT TRADE ABROAD

Early Meat Exports

The evolution of meat exports was slow from the time of the organization of the United States to the middle seventies. Salted meats, tallow, lard, and other pork products already noted were the only exports known for many decades. For example, an extensive trade in English meats had developed during 1861-1862 and a large proportion of the hogs packed in Chicago were cut for the London and the Liverpool markets. Cheap food had become the great problem with the dense population of Europe, and cheapness of pork products as compared with other meats and the ease and economy with which it could be handled and cured, brought it steadily into greater demand. From the block in a Chicago packinghouse 1,000 tons of sides and shoulders were taken, rubbed in salt, loaded upon the cars, and sent to the seaboard. Here, the product was packed away in the hold of a ship between layers of salt, occupying little room, costing nothing for packages, and by the time it reached Liverpool it was fully cured and ready for consumption. If not sent "loose," it was shipped in coarse, inexpensive wooden boxes in "dry salt." An equal quantity of beef would have required cooperage worth nearly \$20,000, and a pound of beef would not go nearly as far towards sustaining the laborer who consumed the products.¹ For this reason it is obvious why the imports of such beef at Liverpool amounting to 35,087 tierces in 1866-1867, should be only 61,000 tierces in 1870-1871, and 41,000 in

¹ *National Livestock Journal* (Jan. 1874), Vol. V, No. 1.

1872-1873. On the other hand, three times as much barreled pork was exported in 1872-1873 as in 1866; seven times as much bacon, and three times as much lard. The trade had so increased that provision merchants in London carried in their regular stocks almost twice as much bacon as they imported during the whole year of 1866.

British Meat Needs

The increase in the export of live cattle on a commercial basis after the Civil War came at a time when the situation in the British Isles urgently demanded new supplies. This demand had a great effect on the development of the American meat industry. For a time British students of agriculture did not realize the situation, but the lack of adequate home supplies of meat was at last seen in 1894.

In that year, at a meeting of the International Health Exhibition, a study was made of the meat supplies of England, and the causes which had checked the development of the home production of meat and the means of securing supplies for largely populated centers. Statistics were presented indicating an absolute, as well as a relative, decrease in livestock. A hundred years before, Arthur Young had said England possessed 3,500,000 cattle, with a human population of only 7,000,000. At that time there was one head of cattle for every two people, but in 1883 there was only one head for every seven people. One of the causes for this decline had been the recurrence of outbreaks of contagious diseases among cattle. Another was the continuous downhill trend of values for mutton and wool which led to a great reduction in the flocks of sheep.²

The demand for meats had become so insistent that by 1870 it was seen that, while the available sources of supply were home and foreign, under each of which heads there were

² MacKenzie, K. J. J., *Cattle and the Future of Beef Production in England*, pp. 9-11.

two classes—live animals and dead or dressed meat—the home source was not to be counted upon for an increase, and the foreign supply must, therefore, be exploited. The home supply had been the mainstay of the English and Scotch farmer, and their strong support had been the profit gained from beef and mutton, but not being able to hold their own, numerous attempts began to be made to transport live American cattle across the Atlantic.

First Cattle Exports

The first exporter of live cattle from the United States to Great Britain seems to have been Nelson Morris, who shipped a few cattle to London and Glasgow in 1868.³ The next shipment of livestock to England for butchering purposes was in July, 1873. On account of the many restrictions on the importation of cattle from the continent of Europe due to the "rinderpest" and other diseases and the high price of Scottish cattle, the firm of John Bell and Sons, Glasgow, Scotland, had experimented with shipments of live beef cattle from America. The first shipment of six head was made in July, 1873, and was so satisfactory that Henry Bell was sent to the United States to make a regular business of these shipments.⁴ Twelve head were soon being shipped on each Anchor Line ship. The first shipments were made on the upper deck in open stalls and the cattle were placed in the care of one of the ship's stewards, although if larger shipments were made it was proposed to employ a special attendant. The cattle arrived in fair condition, losing not more than 50 pounds on an average during the voyage. The first lot of 12 shipped on the "California" was unfortunate on account of a severe storm off Nova Scotia. Four were washed overboard and the others were badly bruised. This showed the necessity of shipping cattle between decks, which required their hoisting. Illinois

³ Nimmo Report (1885), p. 198.

⁴ *Ibid.*, p. 172, letter of T. C. Eastman.

cattle were bought for shipment at an average cost of \$100 per head, the cost of transportation being \$75, making the cost in Glasgow \$175, whereas Scotch cattle of the same grade sold for \$190, giving the importers a profit of \$15. At that time it was thought that the American shipments would not be permanent because German cattle, when quarantine restrictions were removed, could be sold in England for about \$30.⁵

In October, 1876, William Colwell, a cattle dealer of Boston, shipped a cargo of 450 live cattle to Liverpool on the SS. "Istrian," via the Leyland Line.⁶ He continued this business until about 1885, when financial conditions forced him to stop shipments. T. C. Eastman of New York was also a very heavy shipper of cattle to England and Scotland from 1877 to 1885, when he discontinued the business. Hathaway and Swift of Brighton, Massachusetts, also shipped live cattle to London, Liverpool, and Glasgow from Boston a year or two after William Colwell. There was, then, quite a live cattle export trade during the late seventies.

Prior to the winter of 1876 beef cattle had not been shipped in large numbers from the United States to foreign countries because of the expense, the risk incurred, and the monopoly of the European markets by east European stock raisers. Canada, however, had been exporting livestock to the mother country for some time with success, and after the experiments of shipments from the United States already mentioned, it was seen that special equipment was necessary. For one thing, it was essential to have constructed on vessels apartments quite different from anything heretofore in use. Portable stalls in which the cattle were fastened had to be specially made and arranged to give room for feeding and watering, and to be removable with the cattle in them, to different parts of the vessel. The stock was thus brought upon the deck for several hours each day and was given the benefit of the fresh sea

⁵ Taylor, C. H., *History Chicago Board of Trade*, Vol. I, p. 493.

⁶ Nimmo Report (1885), p. 197, letter of William Colwell, dated April 13, 1885.

air. This arrangement was of American invention and it was hoped that its introduction would open Europe as a market for the stock raisers of the United States.

Early Cattle Ship Conditions

Picturesque accounts have been written of the early American cattle ships of the eighties, but the truth would seem to be that, as far as the welfare of the livestock was concerned, it was but little better than the horrors of "the middle passage" in the old slave trading days. After the heyday of the shipping of live cattle from the United States a book on the subject appeared, in which were set forth the drawbacks of that system of supplying American meat to Europe. As a result of a careful investigation it was shown: first, that the live cattle trade compelled ship-owners, if they would carry enough to make it pay, to run great risks, for the cargo was bulky considering the weight; second, the cattle between decks were too crowded and suffered terribly in rough weather; third, that the cattle on the upper deck were put in a kind of cow-shed or a temporary shelter deck which in a storm was liable to be carried overboard, taking with it the livestock; fourth, that the insurance rules were opposed to humaneness of treatment of the animals; fifth, that the overloading was a grave danger to all men who were in charge of the cargo.

Present Conditions

By way of contrast to this situation is the following description from the *New England Magazine* of modern (1909) cattle ships:

At Chicago the cattle are disposed of to one of the large shippers of cattle to be shipped by rail to some of the numerous ports of shipment. Those that are to be shipped from Boston were brought by rail to the Brighton stockyards where they were put into pens for a few days to stretch their legs and limber up after their long journey. On the morning they are to be shipped,

before the cattle leave the yards, they are driven through a chute in order to rope them, either by fastening the rope around their horns, or necks, if they are hornless.

They are taken by rail direct to the steamers either to Charlestown or East Boston. As the steamers are divided into sections for the cattle and it being known how many cattle each section will accommodate, only such a number are driven into the ship at a time as will fill any one section. These sections vary in size from those accommodating from four to twenty or more cattle. As the cattle enter the compartment assigned them men stationed for the purpose, catch hold of the ropes that are on their necks, draw the ends through holes in planks which serve as stanchions and tighten with two "half-hitches." The next day these knots are changed to what is called a "double loop" and the morning the cattle are landed the knots are changed again into an "overhang" loop or a "double bow." In either case these last knots are tied so that a man can run along a row of cattle and with one vigorous pull on each rope free them one by one. Every morning at 3:30, the men are called and at 4:00 they commence watering the cattle.

Throughout the ship on each deck occupied by the cattle are water pipes running overhead through the passage ways and at certain intervals are short pieces of hose by which the small moveable tanks are filled with water. The duty of one man is to keep these tanks filled, dip out pails of water and hand them to another man who passes them to a third and the last man, the foreman of the gang, fills and replenishes the pails in front of the steers till all have done drinking, some drinking as many as six pailsful at a time. In the same way the cattle are again watered at 2:00 o'clock in the afternoon, only being allowed one pail of water apiece.

To water 180 cattle takes four men one and one-half hours.

After watering they are fed hay, say six small bales to 130 head. At 9:00 o'clock, the cattle are given grain, either whole corn, ground oats, or meal. The troughs having been previously cleaned out, the grain is poured in from a bushel bag into pails and distributed in the same way as the water, the foreman of the gang feeding out the grain, giving one half pailful to each steer. After the grain has been fed, the alleyways are swept out and after being watered in the afternoon, the cattle are fed all the hay they can eat and more and what they do not eat is thrown under them for bedding. At 6:30 P. M., two night watchmen take charge till 4:00 o'clock the next morning.

The morning the cattle are landed the knots are changed, the partitions between the different sections taken down and gangways cleared ready to run them off the steamer. As soon as the gangplank for the cattle is secured the agents for the shippers come aboard, take account of stock and take charge of the cattle when landed. When they begin to run the cattle off, the rest get impatient and bellow and stamp and pull at the ropes.

It was seen after many early attempts that the transportation across the Atlantic of live American cattle would not attain satisfactory success, and it was clear that if America were to send its beef and mutton as freely into English markets as it sent its grain, meat would have to go in the carcass.

Frozen Beef Experiments

The first experiments in shipping carcasses were not of chilled or dressed beef, but of frozen meat. Small quantities of beef hard frozen were sent to Smithfield Market from the United States. The hindquarters arrived in long boxes "as hard as stone," but bright and in good condition. This American frozen beef made about $2\frac{1}{2}d.$ to $3d.$ a pound, while English beef in 1874 was getting $9d.$ a pound. On the whole, however, this early frozen beef trade was quite small in volume and negligible as a market factor.⁷ As with live cattle, Nelson Morris seems to have been the earliest shipper of dressed beef to the British Isles, but his first experiment was very crude, consisting of the shipment of a few carcasses of beef on the open deck of a vessel which arrived in England in bad condition.⁸ The next shipper was John J. Bate of New York, who made a shipment of 12 quarters of beef, 12 sheep, and 6 hogs to Liverpool by the SS. "Baltic" on February 11, 1875. This arrived in good condition and was followed on June 6 by a larger shipment, and on August 10, by another cargo. On the first trip, the meat was kept cool and fresh by

⁷ Critchell, J. T., and Raymond, J. A History of the Frozen Meat Trade, pp.

190-191.

⁸ Nimmo Report (1885), p. 172, letter of T. C. Eastman,

fan blowers operated by hand; later the fan blowers were operated by steam.

Dressed Meat Shipments

The first dressed meat sent to Europe in quantity as a commercial article was shipped by Timothy C. Eastman of New York, on October 1, 1875.⁹ He is usually credited with being the real pioneer of the enterprise. Some of that beef was sent to Queen Victoria at Windsor Castle and Eastmans', Ltd., the English agency, received the Royal Seal as a result of that transaction. The Queen pronounced the meat to be "very good."¹⁰ It was, then, with the year 1876 that the business of shipping dressed meat, or "dead meat," as it was called in England, to Great Britain developed a permanent relation to the demands of the English market and became one of the established features of the American meat packing industry.

At once interest was shown in England in the new meat trade, especially among the livestock producing class. It was rather surprising, however, to note that the newly opened enterprise had attracted very little attention in New York in the newspapers, or in circles outside the reporters, butchers, cattle salesmen, and farmers.

For sometime T. C. Eastman was alone in the trade. He shipped to Glasgow and Liverpool, where arrangements were made for forwarding to his markets in London, Manchester, Sheffield, Birmingham, Leeds, Newcastle, Dundee, and Edinburgh. To Liverpool he shipped by the William and Guion and the White Star Lines, and to Glasgow by the Anchor Line. His weekly exports in 1877 averaged about 1,000 cattle and 4,000 quarters of beef. However, as soon as the success of Eastman's experiment seemed assured, after the favorable reception of the first consignments, too many rushed

⁹ Vaughan, *Types and Market Classes of Livestock*, p. 65; Bolles, *Industrial History*, p. 123.

¹⁰ Critchell and Raymond, *History of the Frozen Meat Trade*, p. 190.

into exporting cattle, with the result that the trade was overdone. The majority of people whose enterprise failed did not have enough capital, much of which was required for erecting refrigerators in vessels, for a heavy premium was charged for space and refrigerators in the killing yards. Soon all lines sailing between New York and Philadelphia and England and Scotland—some eight in number—were carrying chilled dressed meat.

Refrigerator Processes

The process whereby Eastman kept his meats fresh was one invented and patented by John Bate. Eastman had special refrigerators built between the decks of the steamships of the William and Guion, White Star, and Anchor Lines. They were about 40 feet long, 28 feet wide, and 9 feet high. On one side was an ice box containing some 30 tons of ice.¹¹ A fan blower run by a steam engine kept the inside air in constant circulation around the meat. The quarters were neatly wrapped in canvas and kept in "chilling houses," or large refrigerators, before shipment and when put aboard the vessels the temperature was kept down to 38 degrees, or 6 degrees above freezing.¹² The cold to which the meat was subjected at first closed the pores and seared it so that it was not as susceptible to heat and taint as freshly killed meat. Eastman was fortunate in having his meat arrive as fresh and bright as newly killed beef and without losing any of its flavor.

Gillett and Sherman, another large New York shipping firm, exporting 2,000 quarters of beef weekly, prepared their beef on the New Jersey side of the river and used a different process, invented by a Dr. Craven—a freezing mixture being forced along pipes running between the rows of beef. They shipped to Bristol and Liverpool by the Cunard, Inman, and National Lines. D. Toffey and Brothers of Jersey City

¹¹ Taylor, C. H., *History Chicago Board of Trade*, Vol. I, p. 575.

¹² Bolles, *op. cit.*, p. 124; Critchell and Raymond, *op. cit.*, p. 191.

shipped about 1,200 quarters weekly by the Banta (fanning) process via the State Line to Glasgow and the National Line to Liverpool. Martin Fuller and Company of Philadelphia shipped about 1,400 quarters of beef every week from Philadelphia using the Bray (fanning) process by the American Line to Liverpool. Morris and Sherman, employing Dr. Craven's process, sent 1,000 quarters by the same steamship line to the same port. Snowden and McConville exported some 600 quarters of beef every week by three National steamers to London. F. Samuels and Company sent 300 quarters weekly to the same port, using the Smiley (fanning) process.

Shipping Preparations

For these shipments both cattle and sheep were brought into the stock sales, either by the farmers themselves, or in consignments by stock agents, the latter being the more general system, and then purchased by the exporters, cattle alive and sheep dead. After the animal was killed the meat hung for two hours to allow the natural heat to escape, and then it was hung in the refrigerators in the yards until transferred to those in the ships. Large permanent refrigerators were erected at the Jersey City stockyards and Mr. Eastman built and fitted up a large building for himself in New York City.

Other firms than these engaged in the export of sheep, but the mutton was all conveyed across the Atlantic in the name of these firms, as in this way it could be carried almost free of cost. The exporter paid so much for space in a steamship to erect a refrigerator, and between the rows of sides of beef there was ample room for a row of carcasses of mutton. This space otherwise would have been unused.

The trade increased with most extraordinary rapidity. In October, 1875, the shipments of fresh beef amounted to 36,000 pounds; in October, 1876, 6,707,855 pounds. For the year ending December, 1877, there were exported 55,362,793 pounds, valued at \$5,244,688.

Distribution in England

On arriving in England, American beef was transported by rail to the large markets, such as London, the railways actually discriminating against the British cattle and beef by carrying American beef several shillings cheaper than the English beef, because of the great volume of the American trade.¹³ The meat was carried in special cars, each quarter being wrapped in cotton to prevent its becoming dirty. In the large markets the beef was handed over for sale to agents, who received a small commission which was included in the cost.

Later on, however, the American exporters, such as Eastman, and Swift and Company, began to open stalls at Smithfield Market in London, paying heavy sums for the goodwill. These men were led to market their own beef because they did not "get a square deal from the Smithfield salesmen."

In spite of its rapid initial success the dressed beef export trade had great difficulties to overcome, which were similar to those it had to fight in the United States. For example, in 1879 a popular caricature had warned the London beef eaters against American beef. On one side was a magnificent sirloin with mingled streaks of white fat and red juicy lean which was labeled "Roast Beef of Old England." On the other side was a dark stringy slab of fly-blown flesh with plenty of sinew and gristle, but no fat, which was marked—"Here's your American beef! Take your choice!"¹⁴

British Prejudice Against Dressed Beef

A great deal of prejudice against American dressed beef is accounted for by the fact that when the dressed beef arrived in England and was taken out of the hold and exposed to the air, it naturally became soft and limpid and lost its bright appetizing appearance. While the meat itself was tender and

¹³ *Lippincott's Magazine* (Nov., 1879), Vol. XXIV, p. 73.

¹⁴ "Where the Beef Comes From," *Lippincott's Magazine* (Nov., 1879), Vol. XXIV, pp. 73-79.

good and wholesome, it did not compare favorably in appearance at first with English home-dressed beef. This situation was due more to carelessness than to anything else, and later shipments went in better shape. However, it was accentuated by the action of some exporters who adopted a short-sighted policy. Some shippers felt they must either abandon the trade for a time, or export an inferior quality of beef which they could buy in America at a lower price than the prime carcasses. Some adopted the former plan and a few the latter.

The trade in England was made more difficult by the fact of a combination among the British butchers, which was brought about for the purpose of stopping importations of American beef. It was claimed that the American article could never be as good as the English. The validity of this contention seemed to be assured by some incidents in the early months of 1878. The chilled beef trade was very greatly handicapped by a general fear of contagion, which led the British government to issue the first of a series of decrees against the importation of American cattle and meats which greatly injured the trade in later years.¹⁵ Under this decree, foreign animals were to be landed only at a special part of the port, to be under regulation of the commissioner of customs and not to be removed from the wharf alive. The ports of landing were Barrow-in-Furness, Bristol, Grimsby, Hartlepool, Hull, Liverpool, London, Plymouth, Portsmouth, Southampton, and Sunderland. A little later the Privy Council by the authority of Act of Parliament issued an order prohibiting the landing of United States cattle, except under certain conditions: (1) such cattle shall be landed at ports with foreign animal wharves; (2) animals must be landed direct into abattoirs and remain there until slaughtered; (3) this slaughtering must take place within ten days from the time of landing.¹⁶

¹⁵ Taylor, C. H., *op. cit.*, Vol. I, pp. 575-576.

¹⁶ *Breeders' Gazette* (Feb. 5, 1890), Vol. XVII, No. 6.

European Restrictions

The restrictions on American beef on account of alleged pleuro-pneumonia extended to pork products because of the alleged presence of trichinae. Other countries began to restrict the importation of American meats. Italy issued a decree in 1879 against American pork products, and Hungary, Spain, Germany, France, Turkey, Roumania, Greece, and Denmark followed during the eighties. A few years after Great Britain restricted the importation of cattle, some of the other countries, such as Germany, Denmark, Belgium, and France, prohibited their importation because of alleged Texas fever and pleuro-pneumonia.¹⁷ These restrictions went into effect, although the official denial by Secretary of State Blaine regarding cholera reports disposed of a statement made to his government by the acting British consul at Philadelphia who had been imposed upon by speculators.

Yet in spite of this situation of opposition and prejudice, the chilled beef trade, especially in England, not only became important after 1880, but made a remarkable advance in the decade of 1888-1897, when it developed a leading position at London in Smithfield Market supplies.

Triumph of Dressed Beef

By the nineties, therefore, it was clear that the prejudice which clung to the "roast beef of old England," had given way of necessity to the foreign product. This, of course, had only come as a result of persistent and indefatigable effort. Among others, G. F. Swift had gone over to England many times and had personally seen that his orders were carried out and that his meat was kept to the front in the market stalls where it had an equal chance. The story is told that the triumph of American dressed beef came when a great London guild was giving a big banquet and one of the features was to be a

¹⁷ Report of the Bureau of Animal Industry, U. S. Department of Agriculture, 1906, p. 9.

huge roast of English beef. The order was given to a friend of G. F. Swift, who believed in American beef and provided one. It was highly praised, and when it was found out to be American the guests were convinced of its worth.

There was, at the same time that the dressed beef trade expanded, a more careful attempt to encourage the trade in cured pork products. As a result there was a greater absolute, though it must be admitted a smaller relative, amount of salted meats exported, for the demand was increasing for fresher packed and lighter salted meats and the old-time barbarous heavily salted hard winter-cured bacon became almost a thing of the past. The use of borax caused this change, for by its use a fresher packed or milder cured article could be shipped.

During the nineties there were alternate reciprocity treaties enlarging the foreign market for pork and beef products. As a result of the law authorizing the inspection of exported meat and cattle which the European nations felt was a sufficient guarantee that shipments were free from trichinae, the barriers were removed. With the slightest rumor of Texas fever or pleuro-pneumonia diseases, however, the embargoes were reinstated. For example, in the spring of 1895, France issued a decree at the instance of the agrarian element. In 1894, the United States shipped \$18,000,000 worth of cattle products to France alone and this trade was absolutely destroyed by order of the French government. Germany and Belgium also put on an embargo. Three years later the first commercial treaty under the Dingley Tariff Act of 1897 was concluded with France, by which a cut was made in the duties on American meats.

American Supplies Important

In spite of all obstacles, by the end of the nineteenth century the trade with Europe had made necessary a continuous service. The *London Meat Trades' Journal*, in commenting upon it, said that:

The weekly receipts of American refrigerator beef and kindred products demonstrates anew the rapid growth and increased demand for these popular shipments, besides proving the prejudice heretofore existing against them has practically become obsolete.

Though the last statement was a poor prophecy, it was evidence that American dressed beef was a governing factor in the English market.

When the American beef supplies in London were short for a few days the price on all kinds of meat went up. A London paper remarked on this as follows:

It is a fact that if the American supply was entirely cut off we should have famine prices in force, so large is the quantity consumed. One reason why English butchers buy American cattle is because they are sent over in such good condition. At home the farmers' cattle come to town in such a bruised state that the farmers lose by the loss of appearance and the butchers by the damage done to the meat. The American cars, on the other hand, are so well appointed that the beasts actually improve by travelling and arrive here without a spot on them.

American beef had become a standard in other countries also. In 1898, Russia and Japan asked for bids from American packers for supplying canned and salted meats for use in their armies and navies. Marketing agencies were opened up in the Orient. Swift and Company established distributing agencies in Tokio, Osaka, Shanghai, Hongkong, Manila, Singapore, and Honolulu. As far as Europe was concerned, the center of the foreign supply system was in London with distributing offices in many cities. In the principal cities of England, Ireland, and Scotland, the distributing plants were almost as prominent as they were in the United States.

Smithfield Market

In the Smithfield Market, London, the American packers by this time sold their meat directly and bought stalls or shops for the purpose, paying substantial sums for the goodwill.

By 1901, Swift and Company held six shops, paying as much as £12,000 sterling for the goodwill of one. Altogether, there were held by American packers some 5 per cent of the Smithfield stalls, or 17 in number.

The tremendous extension of the dressed beef trade naturally had powerful effect upon the production of livestock in the United States. The steady foreign demand for American fresh meats called the attention of the breeders of the Southwest to the necessity of immediate steps toward the improvement of their cattle. Improvement in quality of the cattle raised was followed by increase in American shipments abroad. The statement of English producers that American cattle exported to England were only equal in quality to second-class English cattle was no longer true.

Foreign Tariffs and United States Meats

From the beginning of the twentieth century the American export trade in meats was dominated largely by the attitude of foreign governments and tariffs, which was influenced by the agrarian parties and elements in those countries. As the Great War, 1914-1918, is really a period by itself, attention will be directed first to the period 1900-1914.

By 1900, Germany had become a large importer of American pork and pork products. For a time it seemed that mere economic necessity was enough to enable the trade to forge ahead, but as a result of the Spanish-American War and the popular cry of alleged "embalmed beef," the German agrarians began again with better success their attack on American meat.¹⁸ Following an agitation in the Reichstag, a commission on meat inspection was appointed and reported a bill, which proposed to subject all imported livestock to inspection both before and after slaughter. Realizing that this action would absolutely stop all importation of American meats into Germany, and adversely affect to the value of some \$80,-

¹⁸ *The National Provisioner* (June 17, 1899), Vol. XX, No. 29.

000,000, annually, various American agricultural products, the United States broke off reciprocity negotiations with Germany. This action of the Reichstag commission was taken in spite of strong protests from chambers of commerce in some 125 cities, and the Reichstag itself resolved to insist upon the exclusion of salted meats as well as canned meats and sausages. The bill was passed on May 23, 1900. On the bill reaching the Bundesrath such pressure was brought by the agrarian party that it was at once published officially, thus becoming a law.¹⁹

Yet this was hardly done before the seriousness of barring American meats was seen. The German National Society of Dealers in American Meats published a statement refuting the agrarians' argument and declaring that American meats were harmless and healthful.

Although this agitation had been with reference to American meats especially, there had been no revision made in the general tariff since the nineties when Germany, Austria, and France had entered into a series of commercial treaties, by which the duties they imposed on products coming from all countries enjoying the most-favored-nation treatment were fixed until the close of 1903. As that time approached, important tariff changes were advocated in many quarters, and on December 25, Germany, Switzerland, and Austria adopted new schedules which affected meat and meat products.

Germany Prohibits Beef Imports

By the new German meat regulations the importation of cattle and fresh beef from the United States was prohibited.²⁰ The law stated that fresh meats could be imported only in whole carcasses, and as the American consul-general at Berlin pointed out, when there was added to that the prohibition under Section 21 of the law, of meats preserved with borax and anti-

¹⁹ Taylor, C. H., *History of Chicago Board of Trade*, Vol. II, p. 1005.

²⁰ See German Meat Regulations (*Fleischbeschau-Zollordnung*) with original text, U. S. Department of Agriculture, Bureau of Animal Industry, Bulletin No. 50 (1903).

septic salts, it was clear that the net effect was to diminish the supply and increase the cost of meats in Germany.²¹

In 1905, the German government notified the United States that it intended to denounce the reciprocity treaty of 1900, and that after March 1, 1906, the exports of the United States and Germany would come under the maximum tariff provisions of the new German law. That left as the basis of the right for mutually favored commercial relations between the two countries only the old treaties concluded between Prussian and other German states and the United States before the Empire was established, some of which went back to 1828.

Due to the representations of the United States government, the German government agreed to a tariff truce. The Reichstag passed a bill averting the trade crisis which was at hand, due to the abrogation of the existing reciprocal treaty arrangement. The bill extended to the United States most-favored-nation rates under the new German tariff for a year, or until July 1, 1907. This was not a real victory for the United States, as the new preferred rates were increases on old duties, though not always as high as the new general tariff.

With fresh meat shut out entirely, cured meats, both beef and pork, had until 1906 been sent in large quantities to Germany and had played a very important part in the food supply in all the principal German manufacturing and mining districts.²² However, the military ideal of national self-sufficiency had led the government to encourage the raising of cattle, allowing importation of cattle foodstuffs without duty and putting a severe restriction on meats, with fresh meat entirely prohibited and cured meat partly handicapped by prohibitory duties and inspection laws. Germany was a field for by-products only, such as lard, including neutral, and steam lard, oleo oil, sausage casings, tallow, and raw products, such as hog hair, bones, and hides.

²¹ *The National Provisioner* (July 19, 1902), Vol. XXVII, No. 3.

²² *The National Provisioner* (Aug. 12, 1911), Vol. XLV, No. 7.

French Restrictions

France had enacted a tariff law in the nineties, which was amended by a commercial agreement with the United States in 1898, by which France granted the minimum rates of duty on certain specified products, which included canned meats, sausages, and similar products; and all meat animals of United States origin imported into France (with all articles imported into Spain from the United States also), were subject to higher rates.²³

Like Germany, France required, after the Spanish-American War and the furor of so-called embalmed beef, rigid inspection of all meat animals, fresh meat, and sausages, when imported from the United States. A certificate of inspection from the United States Department of Agriculture was required for all pickled or smoked pork products imported from America. Meats could be imported only at designated customs houses and in certain forms of shipment in order that rigid inspection could be made. For this service, fees were charged as in Germany, which naturally increased prices and limited importation.²⁴

By 1907 the attacks on the sanitary conditions of the packinghouses in Chicago led the French customs administration to refuse the meat guarantee and to require microscopic examination. Considering the situation, Secretary of Agriculture Wilson pointed out that a very insignificant quantity of American meat was exported to France anyway, as the laws had been so strict that it did not pay to cater to this trade.²⁵ It was soon seen that France was suffering from this meat exclusion policy, and the government decided to waive its demand for a certificate of microscopic inspection for all imports of pork meat from the United States. A temporary tariff arrangement similar to that with Germany was entered into, and the United States inspection stamp was accepted.

²³ *The National Provisioner* (Jan. 20, 1906), Vol. XXXIV, No. 3.

²⁴ *Ibid.* (Jan. 20, 1906), Vol. XXXIV, No. 3.

²⁵ *Ibid.* (May 4, 1907), Vol. XXXVI, No. 18.

American meats were welcome in France, as in Germany, to all but the agrarians and the stock raising element, since there was almost a meat famine in the country due to two fundamental facts: first, the policy of the French government, which by protective measures sought to stimulate the breeding of meat producing animals in France, and second, the fact that notwithstanding this encouragement, the production of home-grown meats, both beef and pork, had remained below the normal requirements of the people.

Trade Wanted United States Meats

While French politicians were trying to make capital out of an alleged plan of American packers to invade France and control the meat market, the French provision dealers and butchers were complaining of a scarcity of home-killed meat which approached a famine. For example, M. Canus, president of the Paris Butchers' Syndicate, declared that if conditions were not relieved, there would be a lamb and mutton famine in Paris. The syndicates of provision dealers from Marseilles, Bordeaux, and Havre petitioned the government through their deputies to withdraw its prohibition and allow American bacon, hams, and other preserved pork meats to be imported under the so-called "interstate certificates of inspection," which were recognized and accepted by Great Britain, Italy, and Spain, indeed, in all countries except France, Germany, and Austria. *Le Matin* published an article and a map showing the chief supply centers of all France and declared that the alimentary products furnished by the majority of them had been of a death-dealing kind and that though 25 cities had municipal laboratories for testing food, they did not include Marseilles, Bordeaux, Rouen, Nantes, Caens, Amiens.

English Agitation

The United Kingdom, on the other hand, imposed no duties whatever on the importation of live meat animals or packing-

house products, but in 1906, after the publication of Upton Sinclair's "The Jungle" and the various "investigations" and the new Food Law, there was a great disturbance in England regarding all meats.

A universal shout went up from the English meat packers to the effect that had "home industries" been patronized, there would have been no cause for alarm. Almost at once the importation of American canned meats dropped off. No opportunity was lost by the packers themselves and the trade generally to belittle American products of every kind, and while wrecking the American exporters, these packers made desperate attempts to get their own products promptly before the public. Stores in various parts of London displayed big signs reading: "No American tinned goods sold here—British products only," and "Use honest British goods—don't eat vile American stuff." The triumph, however, was not for long. Dr. F. Cooper, one of the best known medical men, who was also a member of London County Council, stated that:

The public has no conception of the filthy conditions prevailing in most of the English slaughterhouses, especially the small private ones. Most of the small slaughterhouses are absolutely without any inspection whatever; the butchers may kill when they like and under whatever conditions they please. The places reek with filth; they are never properly cleaned up and the conditions make it unfit for human consumption.

As for meat inspection in this country, it does not exist. Inspectors have no training and go by sense of smell—know nothing of bacteriological or microscopic examination.²⁶

British Meat Regulations

The British government, in 1908, issued for the first time through the local government board, certain food regulations called "Foreign Trade Regulations of 1908." This was authorized by an act of Parliament, a Public Health Act, in

²⁶ *The National Provisioner* (Sept. 22, 1906), Vol. XXXV, No. 12, p. 17.

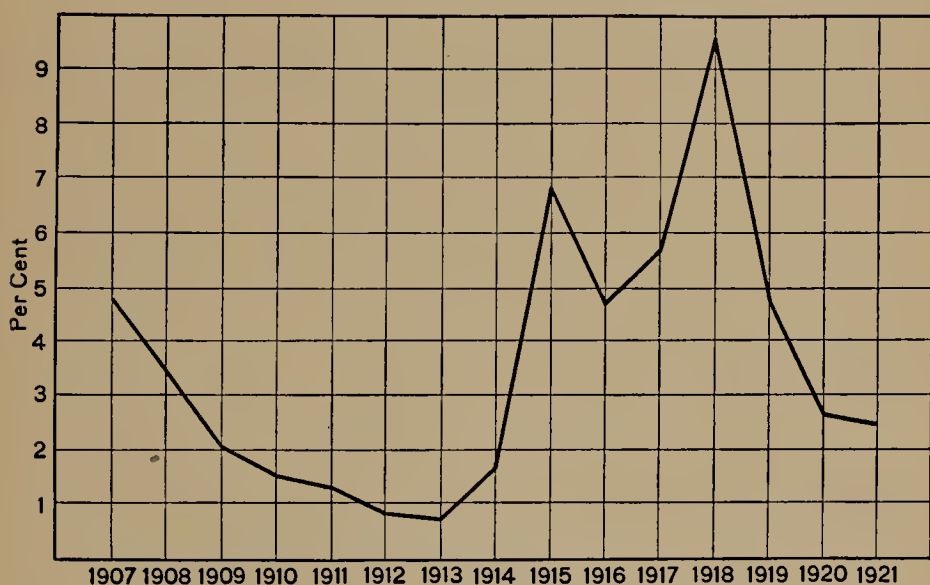
1907, and did not apply to Scotland and Ireland. Its purpose was to regulate the importation of foreign meats and meat products. Up to that time the regulation of meat imports had been left largely to local health authorities, and even with the act of 1907 no such government inspection was provided as existed in the United States. There was no force of government inspectors to carry out the regulations. Their enforcement was delegated to customs officers, local medical health officers, port sanitary authorities, and other hygienic officials.

These regulations provided for the examination of foreign meats by customs officers and medical health officers, notice by the sanitary authorities to the importer, the destruction of the condemned foreign meat, proceedings for proof that the meat was not intended for sale, the prohibition of removal or sale of the meat in certain cases, the keeping of records of meat destroyed, improper landing or transportation of the meat. In doing this the regulation divided meats into two classes: (1) fresh beef, cured pork provisions, canned meats, etc., which were admitted without inspection, provided they bore a recognized certificate from an official source at their place of origin; they could be held, however, and subjected to inspection, should there be any doubt as to their condition; and (2) a class including scrap meat, preserved tripe, hog carcasses without head or glands. These were not admitted without inspection and certification of their healthfulness.

With regard to these regulations the United States Department of State took the matter up with the British government, but the latter would not recede, and the Bureau of Animal Industry advised the State Department that it did not see fit to furnish inspection for export pork which it did not give for domestic consumption. The United States quite rightly insisted on the efficiency of its inspection and quarantine service and procedure relating to the importation and exportation of livestock.

Recent Meat Exports

From 1905 the United States gave way to the Argentine as the great meat exporting country of the world, yet meat and meat products have continued to be a much more important export than is generally realized. The increase in the use of refrigeration in the meat packing industry has led to a rather widespread belief that our exports of meats have practically ceased. Yet, as has been pointed out, these exports averaged nearly the same in value between 1910 and 1914 as



Courtesy Institute of American Meat Packers

Figure 16. Percentage of Beef Production Exported from 1907 to 1921

those of the period 1895-1899, though not as great as they were during the years between 1899 and 1910, as shown by the following table:

PERIOD	EXPORTS
1895-1899.....	\$142,000,000
1900-1904.....	181,000,000
1905-1909.....	183,000,000
1910-1914.....	144,000,000

With the war period, as would naturally be expected, the trade in meat and its products from the United States showed

an immense gain, reflecting higher prices and greater demand. This trade can be summarized in the following table:

FISCAL YEAR	EXPORTS
1915.....	\$ 259,000,000
1916.....	279,000,000
1917.....	370,000,000
1918.....	845,000,000
1919.....	1,014,000,000
1920.....	463,000,000

Wartime Pork Shipments

To see clearly the war situation, it is necessary to consider pork exports and beef exports separately. The United States has always been a very large exporter of pork products. In the fiscal years ending June 30, 1898 and 1899, the high point of 1,678,000,000 pounds was reached, and this was not equaled again until the fiscal year 1918. In the five years, 1910-1914, the lowest point was reached in a period of 28 years, but at the beginning of the war in 1914, a steady rise in exports became apparent, reaching the culmination in 1918 under the stimulus of a large foreign demand and as a result of the conservation practiced by the American people. In March, 1918, the exports reached the enormous shipment of 308,000,000 pounds, with only a slightly smaller shipment in each of the two succeeding months. A shipment that averages 10,000,000 pounds each day of the month and is equivalent to the daily slaughter of 66,000 hogs is an accomplishment that no other country in the world could equal.

In July, 1917, before the United States Food Administration was a legal entity, but when the food problem was beginning to be appreciated in this country and conservation was beginning to be preached as a war necessity, the exports of pork products were the lowest reached in any month previous to that time. The remaining months of the year show very small shipments, also, in relation to the foreign needs and the corresponding months of the two previous years of the war.

Very short supplies and transportation difficulties were mainly the cause.

As a result, in February, 1918, extremely urgent demands were made by the Allies for pork shipments. The further prosecution of the war was shown to be directly dependent on immediate meat and wheat supplies being sent to them. At that time a program was worked out in detail, calling for 300,000,000 pounds of pork products per month for the following three months. It was an undertaking that many considered entirely impossible, but the program was carried out within 25,000,000 pounds of the planned total of 900,000,000 pounds, and the absolute requirements of the Allies were met.

Previous to the United States' entrance into the war, exports of pork products were made to all parts of the world, but immediately on the entrance of the United States, export embargoes were placed preventing shipments except to particular countries and making meat shipments, as far as possible, war supplies. Therefore, the increase in total exports in 1918, over 1917 or 1916, does not alone tell the full story of the participation of the United States in the feeding of the Allies, for it is evident that practically the entire export went to the allied countries in 1918, and that a much larger proportion went to them than in 1917.

Wartime Beef Exports

From 1890 to 1909 the exports of beef products from this country in fiscal years beginning July 1, were maintained at a high level, reaching the highest point of the period in 1906. From that point, there was a gradual decline to the year 1914, when the exports fell to the extremely low amount of 146,000,000 pounds.

Almost coincident with the beginning of the war in Europe, in August, 1914, the exports began to show a very material increase each month, resulting in a total for the calendar year 1915 of two and one-half times the amount exported in 1914.

In March, 1918, immediately after the urgent appeal was made for more food by the Allies, 87,000,000 pounds were sent as a total export, and in the three succeeding months even greater amounts were forthcoming from this country. The total for one year was 773,000,000 pounds, which was over three and one-half times as much as was exported on the average in the three pre-war years (1911, 1912, 1913).

When it is realized that of the total export in March, 62,000,000 pounds was fresh beef that required refrigeration from the time it left the packinghouses to its delivery overseas, in refrigerator cars and on shipboard, the full measure of the efforts is appreciated; and this does not include the shipments to the American overseas forces. Just before the war began, the United States exported somewhat less than 3 per cent of the total production of beef each year, but in 1915, the proportion jumped to 6.6 per cent, and in 1918 to 8.56 per cent.

German Postwar Demand

After the war ended in November, 1918, it was hoped that the export trade would develop in steady fashion, not only with nations which had been neutrals, but also with those which had been belligerents. Those countries had one point in common, namely, the need of the importation of American foodstuffs, particularly meats and grain. At first there was a great obstacle in the lack of ocean shipping, and just as this began to disappear an increasing obstacle was found in the exchange situation. This currency situation has grown steadily worse and only a drastic remedy can succeed.

Even with such obstacles in the way, however, it was absolutely necessary for countries like Germany to get American meats. An official census in 1920 showed that Germany had about 3,500,000 horses, 16,789,000 cattle, 5,000,000 sheep, 14,100,000 hogs, and 4,000,000 goats. In 1913, she had had 21,000,000 cattle and some 25,591,000 hogs.

The German government succeeded in negotiating purchases of food with foreign countries during 1920, and one of the contracts made was with American packers for the delivery of food worth \$45,000,000, or 2,759,000,000 marks. Payment was to be made under a special amortization plan beginning in May, 1920, and continuing for 18 months. The goods were in warehouses in Hamburg, Rotterdam, Amsterdam, and in Scandinavia, and delivery began at once. The American meat industry led the way in aiding the revival of German foreign trade by granting credit, which was the only way out. During the summer of 1920 the Bavarian government announced the abolition of the meat card and the Berlin government abolished it as a national institution September 1, 1920. By October, 1920, Germany was free from livestock and meat control. This was in response to an agitation on the part of meat dealers, e.g., the United States meat packers, the butchers of Germany, the labor unions, the Social Democrats, the co-operative buying associations, and consumers in general. Prices of meat are now cheaper in other foreign countries than in Germany and free imports would lower the cost to consumers. As before the war, there are opposing this the agrarians of Prussia, who have formed associations for selling stock and wish to prevent imports, but their influence is not what it was. The exchange situation in 1922, however, prevented revival of trade.

British Meat Situation

The same general situation exists in Great Britain. The underlying factor is a desire on the part of the livestock producers on the continent of Europe and in Britain to make themselves as self-sufficing as possible. This is impossible for Britain, but she is trying to limit her overseas sources of supplies to the Empire, a perfectly natural attitude for her.

In studying the problem of British meat supplies, the British government came to certain conclusions as to the present

situation of the American meat packing industry and the meat trade between the United States and Great Britain. At first a committee was appointed by the Minister of Reconstruction to investigate the question of trusts, and in its report, issued on April 24, 1919, a whole chapter devoted to the "American Meat Trust" accepted without further inquiry the report of the Federal Trade Commission on the Meat Packing Industry as evidence of combination and control in the industry in this country and of the trade with Great Britain on the part of five of the larger packers.

Acting on this report, a subcommittee was appointed to devise methods to combat this threatening monopoly in the meat trade and to obtain free sources of supply from the British dominions and South America. This committee reported to Parliament, November 9, 1920, that the fear of American companies getting control of the British meat trade had been greatly exaggerated and there were no signs of the Americans trying to capture the home-killed trade or reduce British butchers to a state of dependence.

Empire Needs United States Beef

The report pointed out that while the Empire should be self-supporting in mutton and lamb, it could not be in beef. In 1913-1914 about 50 per cent of British supplies of beef and veal were produced at home, about 7 per cent in British dominions, and nearly one-third in foreign countries. These countries were mostly in South America, and United States packers had through their South American plants nearly 60 per cent of the beef output of Argentina and Uruguay, and about 75 per cent of the capacity of Brazil.²⁷

²⁷ The American companies referred to are Armour and Company, Morris and Company, Swift and Company, Wilson and Company, Inc., and the LaBlanca Company (owned by Armour and Morris) which import meats from their own plants in South America. There are also two British companies, the British and Argentine Meat Company, Ltd., and one Argentine company (The Sansinena Company) which have been co-operated through the River Plate Conference. Another company registered in the United Kingdom and connected with the Union Cold Storage Company, Ltd. (Vestey Brothers, Ltd.), has also had plants in Argentina and Brazil since 1917, but acts independently.

Recommendations made by the committee urged that the British government prevent the share of the beef trade in foreign hands from increasing, that foreign companies be taxed on total profits wherever made, that British packing plants in South America be supported by government and also shipping used for transporting meat to prevent further growth of foreign companies, and that consuming countries take action to limit the business of American companies.

These recommendations were made in spite of the facts admitted that: (1) "it was impossible even for the strongest combination to control prices in Smithfield for more than a few days, partly because climatic reasons and the deterioration of chilled beef in cold storage forced quick sales, partly because a rise in prices speedily evoked an increased supply of home raised meat; (2) that no complaint was made of unfair trading on the part of the American companies except that in 'developing' trade or in clearing surplus stocks they would make no limit in cutting prices. Most of the witnesses praised them for their enterprise in placing cheap meat of good quality before the public and for giving good service to their customers"; (3) that the share of British trade held by the American companies had increased, but "the strength of the American companies depends more on their wealth and business ability than on any conjoint action in this country."

No Meat Monopoly

Indeed the final Report on Meat prepared by the subcommittee appointed by the Standing Committee on Trusts and presented to the British Parliament in the spring of 1921 had made a more careful inquiry, and concluded (Section 13):

The Federal Trade Commission reported that a combination exists in the United States between the five large companies. Our witnesses who had bought in the United States assured us, however, that they had never perceived anything but keen competition among the large packers.

There is, moreover, a growing body of opinion voiced by Sydney Brooks in the *Fortnightly Review* for December, 1920, which seeks to allay this popular apprehension of mere size, which was reflected in the earlier reports. If there is one thing more than another, according to Brooks, that the British should have learned from the war, it is that British businesses are not large enough. This is upheld by governmental committees, when dealing with the iron and steel and engineering trades. Among other things, their small size is "an almost insuperable obstacle to the organization of research." It is pointed out that there is no basic commodity produced by Big Business today which cannot be put out in much greater quantities of a better quality and at a far lower price than in the days when its production and distribution were in the hands of small men with limited capital and equipment.

Meat Industry Economic Benefit

In the matter of meats, Mr. Brooks holds that :

The problem is to devise ways and means which will link producers more closely together so that food will be distributed as widely and as cheaply and as expeditiously and in as wholesome a form as possible. The American packing industry has eliminated the middleman of which class there are far too many in Britain. Three or four more operations on each of which some merchant makes a profit are needed to bring New Zealand lamb to the British dinner table, than are required to bring beef or bacon. The American packers may justly claim to have reduced to a hitherto unattainable minimum those intermediary charges for manufacturing, transporting and merchandising which as a rule are so disproportionately high that the producer receives too little and the consumer too much.

The conclusion reached is cogent at this time. It is that governments and public opinion should inquire very carefully and move very cautiously before electing to thwart an industrial development which is not only an economic necessity, but on the whole a clear national and international benefit.

CHAPTER XIV

PRESENT TRENDS OF THE AMERICAN EXPORT MEAT TRADE

American Beef Exports

The previous chapter on the development of the American export meat trade dealt with the later phases from the point of view of foreign political policy rather than from that of practical operation. At the risk of some little repetition there will be considered here the distribution of American meat products among various foreign countries according to their individual tastes, and the methods of packers in filling foreign orders, including details of shipping.

At the present time, as for many years before the war, the American export business in meats is done largely in pork products,¹ and since beef must compete in domestic markets against pork, it is interesting to note that the level at which that competition is conducted is influenced to no inconsiderable extent by European demand for hog products. This demand is created, directed, and limited by such a multiplicity of factors as to make export trading one of the most difficult, sensitive, and fascinating of all businesses. Nothing can illustrate this point better than the course of the American export trade in beef between 1914 and 1921, as shown in compilations issued by the United States Department of Agriculture which by giving quantities rather than value show more clearly the different trends as noted in the previous chapter. In 1914

¹ Based largely on special study and on "The Export Traffic in Meats," by C. E. Herrick, former Chairman, Traffic Committee, Institute of American Meat Packers, in *The Producer* (May, 1922), Vol. III, No. 12. This excellent article summarizes the situation admirably. Mr. Herrick is now (1923) President of the Institute of American Meat Packers.

the shipments of beef abroad, which had been steadily declining for some years, totaled only 95,000,000 pounds. The next year this figure had grown, because of the war, to 399,000,000 pounds—an increase of 320 per cent in one year. By 1918 yearly exports of beef from the United States had mounted to 728,000,000 pounds, equivalent to about 10 per cent of all the beef produced in the United States. Only three years later, in 1921, shipments of beef from the United States had shrunk to 52,000,000 pounds, equivalent to only eight-tenths of 1 per cent of the beef production, which was a decrease in this period of more than 675,000,000 pounds in the effective foreign demand for the primary products of American cattle.

Pork Export Cycle

During this period pork had been passing through a cycle somewhat similar. According to the compilations of the Department of Agriculture, exports of hog products during the four years previously mentioned were as follows: 1914, 377,000,000 pounds; 1915, 906,000,000 pounds; 1918, 1,724,000,000 pounds; 1921, 748,000,000 pounds.

On analyzing the export figures the following facts emerge:

1. Pork exports showed an increase of more than a billion pounds, or 360 per cent, from 1914 to 1918.
2. Pork exports showed a decrease of nearly a billion pounds—976,000,000 pounds, to be more nearly exact—from 1918 to 1921.
3. To produce 976,000,000 pounds of pork—the decrease from 1918 to 1921—about 6,000,000 hogs would be required.

It might also be stated that pork exports were heavier in 1919 than in 1918, so that the tremendous slump in foreign trade from which American packers and producers suffered so severely occurred—generally speaking—within the brief period of two years.

Decline in Meat Exports

Using figures from the source already cited, consider the years 1918 and 1921. In the former, 8,854,000,000 pounds of pork products were produced and 1,724,000,000 pounds were exported; in the latter, production had fallen off only 4 per cent as compared with 1918, while exports had fallen off 57 per cent. As a consequence, more pork products had to be consumed at home, which means that the domestic purchasing power was less in 1921 than in 1918. The tendency of all this was, first, to place more pork in competition with beef on the domestic market; and, secondly, to place this greater amount of pork in competition with beef for the consumer's meat dollar at lower levels.

The severity and consequences of the slump in exports were aggravated, especially during 1921, by the fact that wholesale meat values abroad, like those at home, declined tremendously. While the quantity exported was shrinking, the value was shrinking even more. This is shown clearly in two statements issued by the Institute of American Meat Packers and based on official statistics of the United States Department of Commerce.

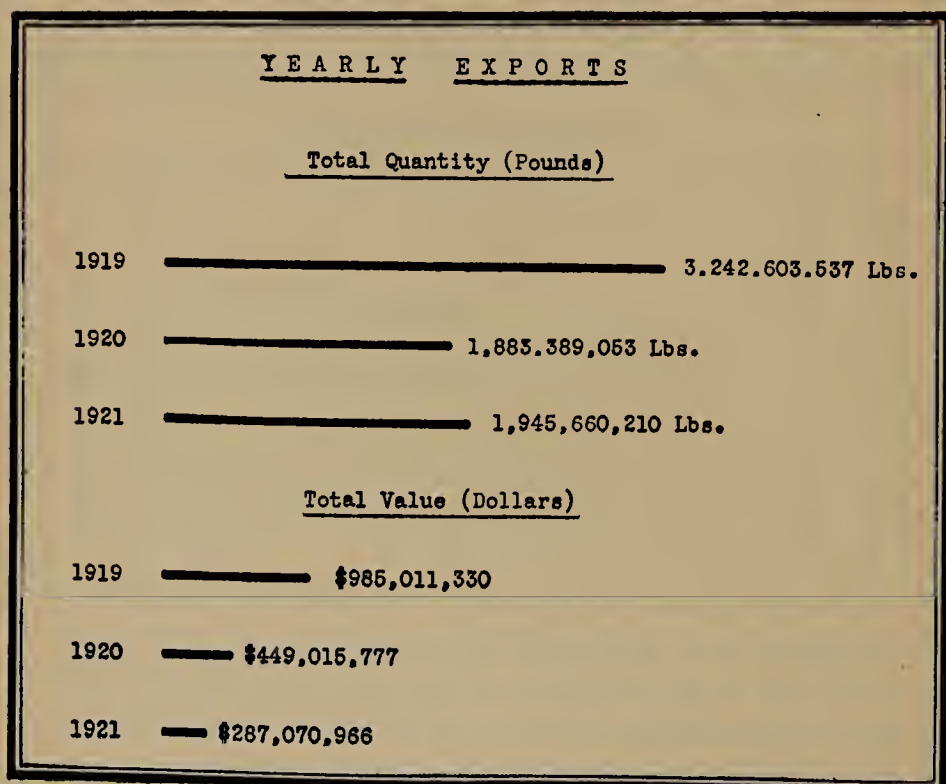
Although exports of meat and meat products during 1921, as compared with 1920, showed an increase of 3 per cent in quantity, the value decreased 36 per cent, according to official figures now available. Exports of all kinds of meat and meat products during 1921 aggregated 1,945,660,210 pounds, worth \$297,155,180, as compared with 1,883,389,053 pounds, worth \$462,500,064, during 1920. These figures indicate the tremendous declines which have occurred in wholesale meat prices during only one year.

Meat Exports in 1921

One of the outstanding features of the year's export trade was the great increase in the amount of lard shipped to other countries. During 1921 exports of lard—892,883,645

pounds—were about 270,000,000 pounds, or 40 per cent heavier than during 1920, but the value decreased about \$33,000,000, or 22 per cent. A comparison of 1921 and 1913 figures shows that lard exports in 1921 exceeded 1913 shipments by about 317,000,000 pounds.

Exports of hams and shoulders in 1921, as compared with 1920, increased about 24 per cent, or 47,000,000 pounds, in



Courtesy Institute of American Meat Packers

Figure 17. Chart of Yearly Exports of Meat and Meat Products

quantity, but decreased more than 6 per cent, or \$3,000,000, in value. "Bacon" exports showed decreases both in quantity and value. The quantity exported in 1921 was 415,299,522 pounds, which was 34 per cent, or 221,376,050 pounds, less than in 1920, and the value in 1921 was about 56 per cent, or \$88,121,905, less than in the preceding year. Exports of fresh beef during 1921 amounting to 10,412,790 pounds, were

the lightest since 1913, when only about 7,000,000 pounds were exported.

Average Value of Exports

The average value per pound of all meat and meat products exported during 1921 was 14¾ cents, as compared with approximately 30½ cents in 1919, the peak year. This represents a decline from 1919 of more than 51 per cent in price. The average value per pound of meat exported during the month of February, 1922, was only slightly above the value per pound of meat exported during February, 1913.

The export figures cover fresh, pickled, and cured meats of all kinds, animal fats, sausage, and sausage casings. Many of the pork cuts exported are unfinished; that is, they have not been smoked and otherwise fully prepared for the consumer's use. With allowances for such considerations, the value of meat exports per pound is in line with average wholesale prices prevailing in the United States.

Meat Export Markets

The present distribution by countries of American meat exports is a matter of some interest. Here, too, war had made differences; but now, as normally, the United Kingdom is our best export customer, with Germany next. In discussing this foreign trade situation, the heads of export departments of meat packing companies usually attempt to distinguish between two general sources, or groupings, from which the demand comes. These two groupings are "the U. K." and "the Continent"—meaning, of course, the United Kingdom and continental Europe. Within this latter group the different sources of demand are usually further classified as follows: Germany, with Hamburg as the chief trading port; the Netherlands, with Rotterdam as the port; Belgium, with Antwerp; and the Scandinavian countries. Italy and other individual nations are generally considered by themselves.

It is of course true that ports have a key relation to the export trade. Thus an export trader, in summarizing business with Holland and contiguous trade territory, might say: "The break in the exchange value of the mark in March practically stopped even the slow trading which had been going on with Hamburg. It also affected business with Rotterdam, since some trading with Hamburg had been carried on through Rotterdam."

Where United States Products Go

While it is unsafe to speak in set terms about the relative importance of the specific foreign outlets for American products, since the export trade is still changing and a generalization which is true now may not be true this time next year, an analysis of our export trade during the calendar year 1921 is valuable. For it shows that the United States' three best customers—ranked in order in each case—for some of the chief export of meat products were as follows:

Bacon: United Kingdom, Germany, Netherlands.

Hams and shoulders, cured: United Kingdom, Canada, Cuba.

Lard: Germany, United Kingdom, Cuba.

Neutral lard: Netherlands, United Kingdom, Norway.

Oleo oils: Netherlands, France, Norway.

Beef, pickled and otherwise cured: Newfoundland and Labrador, United Kingdom, Norway.

Beef, fresh: Belgium, United Kingdom, Mexico.

This list would be meaningless without some information as to the relative importance of the different items. The following table shows the total amount of each of various meat products exported from the United States during 1921:

	POUNDS
Lard, including neutral.....	892,883,645
Bacon.....	415,299,522
Hams and shoulders.....	232,380,427
Oleo oil.....	127,977,713

	POUNDS
Pork, fresh.....	56,083,263
Lard compounds.....	48,206,583
Pork, pickled.....	32,850,107
Stearin from animal fats.....	32,696,424
Sausage casings.....	31,521,187
Beef, pickled, etc.....	24,570,582
Tallow.....	13,797,928
Beef, fresh.....	10,412,790
Mutton, except canned.....	7,515,438
Sausage, all other.....	6,352,131
Beef, canned.....	6,077,248
Oleomargarine.....	3,329,049
Sausage, canned.....	2,556,091
Pork, canned.....	1,150,082

Hog Types and Export

American packers have sometimes been criticized because they have not urged American producers to breed a type of hog specifically adapted for the export trade. Those who advance this suggestion overlook several elements in the situation: first, that domestic rather than foreign demand constitutes by an overwhelming ratio the biggest part of the market for American pork products, and hence for American hogs; secondly, that the export trade fluctuates in its volume and its requirements, and hence that the producer who directs his breeding operations toward a particular export demand may find that when his hogs are ready his specific market is not; thirdly, that the American hog produced for domestic needs also is adapted to furnishing the cuts which continental Europe normally seeks from the United States; and, fourthly, that it would not be practical for farmers in the leading hog producing sections to attempt to raise a pronounced "bacon type" of hog on the corn ration that is so well suited to the production of the "lard type" of hog.

It is true, of course, that different countries and different groups of countries differ in their tastes. These differences naturally create different foreign trade needs, which are

reflected in the American packer's demand for hogs and in the cure he gives to his various products.

Britain Wants Light Hogs

The United Kingdom wants hogs of lighter weights, for the Britisher likes his meat lean. He also insists that it have a very mild cure. These two preferences of his palate constitute two fundamental elements in the English trade which always must be kept in consideration. How important these two appetite factors are is demonstrated by the fact that it is not uncommon for Danish bacon to sell at wholesale in England several cents a pound higher than American bacon, which appears at first to be strange. The explanation, however, is both simple and convincing. In the first place, Denmark, like a number of other European countries, lacks an abundance of feedstuffs, and consequently is disinclined to hold hogs for a long time or to feed them sufficiently to make them very fat. Moreover, the character of much of the Danish feedstuffs—barley, beans, cowpeas, and skimmed milk—does not result in the addition of the same amount of fat for each month of feeding, as is the case in the United States. That is why Danish hogs make lean meat. As a result of long years of feeding and breeding hogs for the bacon trade, the Danes have evolved a longer, leaner type of hog than that produced in this country. In the second place, Denmark is much nearer to England than is the United States. A shipment from Denmark may reach England within 48 to 72 hours from the time it left the Danish port. Moreover, the whole journey has been by salt water, through sea-cooled air. Under such circumstances it is possible to give Danish bacon a very brief cure. However, it is not to be conceded in any sense that the Danish cure is superior to the American cure. The important point is that the Danish producers have evolved a type of hog especially adapted for the definite requirements of British bacon trade.

Wiltshire and Cumberland Cuts

It has been stated already that the Englishman likes his pork lean. On this account only hogs weighing about 140 to 200 pounds are adapted for making pork cuts destined for the United Kingdom. Further, the hog to be used in the British trade should be a "smooth" animal. When dressed, the resulting cuts are distinctive, both by name and shape. The two most famous English cuts are the Wiltshire and the Cumberland. The Wiltshire may be defined, for practical purposes, as the whole dressed side, including the ham; and the Cumberland may be similarly defined as the whole dressed side except the ham, which has been removed.

Reference to the export tables previously cited will indicate that American packers send to the United Kingdom enormous quantities of "bacon." It should be noted here, however, that in the export trade with England this term may include many cuts besides the usual variety of bacon which so often accompanies eggs to the breakfast tables of hundreds of thousands of American families. It may include not only bellies, as one would anticipate, but also Wiltshires, Cumberlands, short clear backs, etc. For example, the Wiltshire is the sort of side which English consumers commonly order. Practically all the sides which Denmark ships to the British Isles are Wiltshires. A Wiltshire includes the ham. Consequently, Denmark, having sold the ham with the Wiltshire, cannot sell the ham separately, but England is a big buyer of hams as separate cuts. These hams are cured in "pickle" from 40 to 60 days, the period depending on the size of the hams and on the season of the year—the warmer the weather, the longer the cure. The "pickle" consists of water, salt, sugar or syrup, and salt-peter. The chief effect of this last ingredient is on the color.

Shipping Hams to England

Hams are shipped in boxes, by train and refrigerator vessel. When they reach England, they are usually either

smoked and then sold, or "pale dried," i.e., washed and hung in a fairly cool, dry room until the surface moisture has evaporated, and are then ready for market. When the Wiltshire reaches the English traders, ham and shoulder are cut off. This leaves what corresponds to the American short clear middle, which, in turn, may be split, leaving a short clear back and belly.

The American packer who exports meats to England competes with Danish, Swedish, Dutch, and other continental European products; with Irish and Canadian provisions; and with a certain quantity of home-produced supplies. Canada uses feeds that make leaner hogs than the American, and at the present time is urging her producers to aim at the "export type" of hog. Ireland, too, raises leaner hogs with firmer fat. The Irish do not feed hogs in droves, and the feedstuffs used include slops, beans, potatoes, and skimmed milk. China offers some competition in the United Kingdom on lard and on meats, but it is not to be compared with that of the nations just mentioned, all of which, except Canada, enjoy one large advantage, viz., proximity.

What Europe Wants

Continental Europe, under normal conditions, takes many cuts of meat which are not marketable at home in adequate volume. Examples of such cuts are heavy fat backs and heavy clear bellies. The southern states in America, of course, ordinarily buy some of these heavy sides, but always at a decided discount as compared with lighter sides; and fat backs, light or heavy, are practically unknown in the retail trade in the United States.

There was a time when Germany prohibited the importation of meats weighing more than two kilos, thus letting in sausage, but permitted the importation of live hogs. At that time Scandinavia sold Germany live pigs when they reached a weight of perhaps 60 pounds, and then bought cured pork

from the United States. The explanation of what seemed a paradox is as follows: Scandinavia, with a cold climate, wanted heavy, fat pork, but in order to finish and fatten hogs accordingly would require imports of cottonseed meal, corn meal, etc. The Scandinavians avoided this necessity, to a degree at least, by selling their hogs at an early age and importing side meats from the United States. Germany had considerable quantities of feeding stuffs, refuse from her beet sugar industry, for example, and she paid a good price for the pigs, because that was the only form in which extensive pork supplies could be imported. At the same time, the outlet to Scandinavia for American pork took care of a considerable quantity of our heavy side meats, for which there was little domestic demand.

Changing Conditions

Today the situation is entirely different, not only in the fact that the German regulations on importations have been changed, but also because the Scandinavian countries, having extended themselves on credits to central Europe, are not financing imports of meats or feedstuffs as extensively as might be desired. In addition, on account of the exchange situation, Scandinavia is more nearly self-supporting with respect to pork, since these countries now refrain from exporting their young pigs to the same extent as formerly, but instead, fatten them as much as is possible without bringing in an undue quantity of feeding stuffs from this side of the water.

Continental Europe, in general, although needing pork stuffs badly, has focused its purchasing rather heavily on fats and oils, somewhat to the exclusion of heavy bellies and fat backs. Difficulties of finance have caused this situation, which brings up the question of payment. Before the war there were four methods by which European nations could pay: first, gold shipment; secondly, sale of United States securities owned abroad; thirdly, shipment of manufactured goods; and

fourthly, offsetting against their debts to us their credit balances due from other nations, thereby compelling their own debtors to finance in one of the ways just enumerated.

How Europe Pays for Meats

The method of gold shipment has now been practically eliminated on account of our heavy holdings of gold, and the second method has been eliminated by the sale to us during the war of United States securities owned abroad. Some business is being financed in rather limping fashion by the third method, while the fourth is of limited usefulness on account of the restricted production in foreign countries, with the consequent difficulty of creating credit balances. Most continental countries, especially those having devastated regions, have recuperated slowly with respect to their ability to send manufactured goods abroad in great quantities. They have had difficulty in deflating labor costs, as well as with their expensive stocks.

None of these conditions, however, should be interpreted as an assertion that export trade is at an end. On the contrary, meats are being exported in considerable quantities, and it is worth while to examine the normal tastes of some of the individual countries.

Scandinavia Takes Heavy Hogs

Scandinavia, for example, likes heavy hogs. In the winter the products from these hogs can be shipped with relatively light cure, because they are packed in salt and because they are going to a cold climate. In cold weather the cure completes itself while the goods are in transit. In warm weather this is not possible, and the cure must be completed in the packer's cellar. These Scandinavian countries takes the entire side between the shoulder and the ham, i.e., short middles. These middles are cured in dry salt. In summer the time required for the cellar cure ranges from about 40 to 60 days. Then the

goods are in transit from a typical packinghouse center to a Scandinavian port for 30 to 40 days more, making a total interval of perhaps three months from the time the hogs are killed until the time the goods are available for consumption.

Holland

Holland formerly bought large quantities of neutral (leaf) lard and oleo oils for her margarine factories, but now, on account of the development of the hydrogenation process, Holland uses vegetable fats in large amounts. These fats, such as cocoanut and palm-kernel oil imported from the Dutch East Indies, are deodorized and hydrogenated. Hydrogenation makes them firm. Prior to the bad break in German exchange, which occurred in March of 1922, some fat backs were bought by Dutch traders for shipment into Germany.

Latin European Meat Demand

In normal times Belgium and France provided a large outlet for heavy fat backs and clear bellies, which are not marketable in this country. Some of the Belgians and French utilize those meats by cooking them in a pot with potatoes. Spain, too, was a buyer of fat backs until June, 1921, when a new tariff duty became effective and practically prohibited these importations. Italy normally uses some American lard and fat backs, but at the present time she is leaning principally on her own domestic vegetable fats, such as olive oil. The cures on these dry salt meats for Italy, Spain, and the north African provinces naturally require a longer time, since the meats are destined to be subjected to a higher temperature, and since the cold storage facilities in those countries are not fully adequate.

The character of the central European and Danish trade already has been indicated. Enough has been said about the trade on the Continent to show that there has been a constriction in the outlet for those cuts which constitute the surplus

here; that is, those most difficult to market at home. For this reason, our inability to market many of the fat and heavy cuts at home, pork was sold during the winter, 1921-1922, below parity with the price of live hogs. Some of the cuts held up their values fairly well, but the aggregate returns from the whole carcass was not satisfactory.

How Meat Exports Are Sold

The larger packing companies maintain branch houses abroad. Each of these branch houses receives quotations from its parent company, and exerts its best efforts to sell in accordance with these quotations. Smaller packing companies usually work through brokers, to whom offers are made by cable. These offers are good for acceptance within a stated period. When a broker receives such offers, he canvasses buyers—sometimes by wire, sometimes by telephone, and sometimes in person. He may cover a city, a province, or a state. Sometimes the price quoted to the broker is unobtainable. In that case he may cable back a counter-offer which he has received, and this counter-offer may either be accepted or declined by the company which he represents. Such brokers work on a commission basis. Frequently a large packinghouse will cable quotations by merely giving a price on one weight and grade of a given cut, leaving it to the foreign representative to apply a proper differential to the other cuts and other grades. Thus, if a foreign agent receives a quotation on hams of a certain grade weighing 14 to 16 pounds, he knows the price at which hams of another weight are available.

On occasion an American packer faces the necessity of instructing his foreign agent to take the best price possible for a certain commodity, in order to move it and receive other commodities. He may also instruct his agent to reship some of his supplies. For example, if a large packing company has a big quantity of fat backs in Antwerp and the trade for fat backs there is slow, it may cable its agent in effect: "Send half

your fat backs to Rotterdam and the other half to Marseilles." So-called "small" packinghouses do most of their business at prices agreed on before the goods leave this side of the water. The agreed price includes cost, insurance, and freight, and hence is known as "C.I.F." sale.

Competition and Exchange

Competition in foreign, as well as in domestic markets is quite severe. Some packer may have a surplus of a particular cut. He names a low price. Other packers have to meet it if they wish to sell their stocks. The demand also seems to vary from one cut to another, just as it does at home. In the domestic market in 1922 there was an almost uninterrupted demand for pork tenderloins, whereas the export trade demanded hams in increasing quantities.

Before the war, prices usually were quoted in the currency of the country to which the goods were destined to go. Now all American packers try to sell in terms of dollars—dollars per 112 pounds in the United Kingdom, dollars per 100 kilos on the Continent—in order to avoid the risk of exchange fluctuations. On C.I.F. shipments the time of delivery is specified. "Prompt shipment" is the usual procedure. In the case of the United Kingdom this generally means within ten days from the date of sale; on most of the Continent, within two weeks from the date of sale; and in Scandinavia, within three weeks from the date of sale. The seller must guarantee the weight of the goods on arrival within certain narrow limits. The buyer must weigh them with reasonable promptness.

Careful Currency Calculation

Making an offering by cable is no simple matter for anyone except a well-trained expert trader. Suppose, for example, that an American packer on May 1 cabled to his Liverpool representative, offering a certain number of boxes of Cumberlands of specified weight to be shipped from an American

packinghouse within ten days at a price of so many shillings per English hundredweight. To calculate such an offer, the seller must take the net price F.O.B. his packinghouse, and then must add to it the cost of packing the meat in export boxes, and the freight from Chicago to seaboard and from seaboard to Liverpool. He must also add an insurance charge, based on the sale price plus 10 per cent prospective profit for the buyer. This augmented price must be increased by a sum sufficient to cover shrinkage, the expense of necessary supervision at seaboard when the shipment is transferred from rail to boat, agent's commission, and interest on money during the interval elapsing before funds will be available to the shipper. In summer time icing and re-icing expenses must be figured. When all of these calculations have been made, the price must then be computed in shillings instead of dollars, on the basis of 112 pounds as a unit instead of 100 pounds. When the price is made in shillings, which is not usually the case now, the packer must also consider what he thinks shillings will be worth 10 days from now when he ships the goods, and 40 days from now when he tries to convert the shillings into dollars with which to buy stocks and pay his workmen. On receipt of the cablegram making the proposition, the packer's representative will place the offer before prospective buyers. He may not get the price asked, and he may have to try to get a counter-offer and cable that back to the parent company.

Simplifying Correspondence

Methods of simplifying cable correspondence and of keeping the expense down to the minimum have been worked out with great nicety. Here is an actual example, with a few letters changed for purposes of disguise, of what can be done with a particular packer's cable code: If the American packer wires his foreign agent "Enelataw," and the foreign agent answers "Anelatawik," the exchange means that the packer has said to his agent: "We offer 50 boxes of Cumberlands,

averaging 32 to 36 pounds in weight, for shipment within ten days, at 100 shillings per English hundredweight C.I.F. Liverpool"; and the agent's answer means: "Offer accepted for 50 boxes of Cumberlands, averaging 32 to 36 pounds in weight, for shipment within ten days at 100 shillings per English hundredweight C.I.F. Liverpool, Smith Higgins & Co."

Shipping Arrangements

When the order is finally accepted, the next thing for the packer to do is to make shipping arrangements. This means primarily obtaining reservation on a suitable steamer. It is an advantage, of course, to have space on a large boat plying direct. On a small boat the goods are necessarily stored nearer to the engines and boilers. The heat increases the shrinkage and is otherwise undesirable. After shipping arrangements have been made, it is necessary to provide for the shipment to go forward from the inland point, if the packer is situated in the interior, in time to connect with the steamer. In the case of pickled goods the meats must be drawn from the vats and drained for 48 hours before being packed. As soon as drainage has been completed, the meats are placed in rows or tiers within boxes, and pressure is then applied. A tightly packed box is better able to withstand rough handling. Moreover, the tighter the contents are packed in the box, the less air space there is, and this is an advantage.

It takes practically 50 boxes to make a minimum carload. Therefore, it is desirable to get big orders or consolidate shipments to the seaboard. It is good practice to have a representative at the seaboard to keep in touch with the railroad officials there, in order to make sure that the car is not delayed in transit and to advise the representative of the vessel when the car arrives. When the goods are stored in the ship's hold, a great deal depends on the judgment of the master stevedore with respect to which compartment the meats should occupy. Long before this the shipper probably has got his papers. He

generally obtains a through bill of lading from the port of shipment to the port of destination. Then as soon as he can get the government certificate of inspection, weight sheets, insurance, marine insurance, certificates, and his invoices filled out, all of which are to be attached to the draft on the buyer, he forwards his draft abroad, usually through a bank. In the United Kingdom the draft is made payable at 30 days after sight. A local bank in the foreign country presents the draft to the buyer, who writes "Accepted" across its face, and signs his name and the date. The draft becomes due 30 days later.

Fast Shipments

As a great many of the shipments are made on comparatively fast boats, there is every probability that the meats will arrive before the 30-day period has expired. It is the practice of buyers in the United Kingdom to pay the draft as soon as the goods have arrived, thereby obtaining the bills of lading and authority to obtain possession of the shipment. Goods not removed within a specified number of hours are placed in a warehouse by the steamship company and held there at the risk of the owner. Meats exported from the United States are generally sold to a wholesaler on the other side. He usually processes these meats, which finally find their way into the butcher shops, delicatessen stores, and other media that reach the consumer directly in the foreign countries to which American meat products are exported.

CHAPTER XV

THE UNITED STATES FEDERAL MEAT INSPECTION SERVICE¹

Inspection the Result of Dressed Beef

The rise and spread of the dressed beef trade brought in its train several results of great and lasting economic benefit. Perhaps the most important of these has been the federal meat inspection service, which was made possible by concentration of slaughtering in large-scale plants with wide distributing facilities.²

Meat animals are subject to many diseases which impair or destroy the wholesomeness of their meat as human food, but the presence of the effects of disease are not always discernible in the dressed carcass. A piece of meat may carry the germs of a dangerous disease without giving any indication of this fact to the consumer. To detect disease there should be an expert inspection at the time of slaughter. The natural and logical authority to conduct such inspection is the government, which is the only disinterested party. Private inspection would not receive sufficient confidence for the public to make it a success on a national scale.

To protect the people at a point where they are unable to protect themselves has been, generally speaking, the object of the meat inspection. Diseased meat is the direct cause of disease in those who eat it. The consumer, being himself unable to determine whether or not the meat he buys is diseased,

¹ Of necessity this chapter treats as part of its subject matter the slaughtering methods of the modern packinghouse. Hence a separate chapter on this phase is superfluous.

² First Annual Report, United States Bureau of Animal Industry (1884), statement by Edward W. Perry.

demands that he be protected by the government from the cupidity or ignorance of the man from whom he buys.

Historical Periods

Meat inspection in the United States falls naturally into three periods: (1) from the opening of the Union Stock Yards in Chicago in 1865 to the year 1890, when the first federal Meat Inspection Law was passed; (2) from the latter year until the passage of the law of 1906; (3) from then until the present time.

By the year 1851 the packing industry had become firmly established in Chicago, and by 1865 packing had become an important part of the business of Kansas City, St. Louis, Omaha, St. Joseph, and Cincinnati. With the establishment of the Union Stock Yards in Chicago, meat packing was reduced more nearly to a system, and the city health authorities instituted an inspection of the packinghouses. An inspector was stationed at each of the two gates through which the animals passed from the railroad on their way to the stock pens. These health officers were "practical butchers whose experience enabled them readily to detect any cattle or hogs that might be suffering from disease or were not fit for human food."

The first statistics of cattle inspection were compiled in 1881, when out of nearly 2,000,000 cattle inspected for slaughter in Chicago, 515 were found to be diseased. In 1870 United States Commissioner of Agriculture Horace Capron saw the danger that menaced the public from eating unwholesome meats. In urging the establishment of a division of veterinary surgery in the Department of Agriculture, he wrote:

The value of stock lost annually from disease is enormous and threatens not only to decimate our animals, but to expose the human family to disease from the consumption of unwholesome meats.

Packers Aid Inspection

In September, 1882, a number of articles appeared in Chicago newspapers, declaring that numbers of diseased animals were taken from the stockyards and slaughtered for food for human beings. The articles were very graphic in their description of scenes in the slaughter houses and stockyards and were copied widely in the eastern states, as well as in Europe. Although it was explicitly stated that great care was used by canners and by shippers of dressed beef to prevent the slaughter for their use of animals unfit for food, the effect of those articles was damaging to the interests mentioned.

The principal packers and shippers of beef at once exerted themselves to assist the city health authorities of Chicago in their efforts to prevent the sale of any animal suffering from disease or from injuries that made the flesh unfit to eat. The department of health had authority for this purpose over the entire area within a line one mile outside of the limits of the city. An inspector was stationed at each slaughter house, and one was constantly on duty at the stockyards during the hours when the gates of the yards were open for the passage of stock. The officers scrutinized the animals offered for sale, especially those destined to be slaughtered in Chicago. If an animal exhibited indications of a disease making the flesh unsuitable for food, it was ordered sent directly to an establishment where the carcass might be converted into fertilizer. Employees of the canning companies and of shippers of dressed beef reported to their principals or to the inspectors the presence in the market of any diseased animal, and condemnation quickly followed.

Inspectors were also stationed at the wholesale markets to examine the meats offered for sale. When the meat was condemned, kerosene was poured over it.

Edward W. Perry, Special Agent for the Bureau of Animal Industry, after investigating conditions at Chicago, wrote as follows:

These facts seem to warrant the assertion that the meat supply of Chicago is practically entirely wholesome. Self-interest leads the packers and canners to use every available means for preventing even the shadow of suspicion resting upon the goods they have to sell; hence they have become most effective aids to the health department, which has given proof of efficiency in this branch of its work.

Foreign Prohibition of United States Meats

It is clear that inspection by city health authorities and by the packers themselves prevailed in the Union Stock Yards in Chicago and in the slaughter houses of other cities for a number of years prior to 1881, and it is probable that a more or less efficient inspection was practiced from the beginning of the meat packing business. That this inspection was not satisfactory to some foreign governments, however, was shortly to be shown by the action of several nations in placing restrictions upon American exported meats, and finally in prohibiting them entirely. The decrees against American meats were considered unjust, for the general physical condition of the animals in this country was better than in other countries, and it was generally accepted by stock raisers and meat packers that the prohibition was for the purpose of preventing competition.

Restrictions began with pork products, Italy being the first country to issue a decree, in 1879. She was followed by Hungary a few months later, Spain and Germany in 1880, France, Turkey, and Roumania in 1881, Greece in 1883, and Denmark in 1888. The reason assigned by these countries for prohibiting the entry of pork was the alleged presence of trichinae and the impracticability of a sufficiently thorough microscopic examination to guarantee that the meat was not affected. Following the passage by Congress of the law of 1891, and the commencement of microscopic inspection of pork, Germany, Denmark, Italy, France, Austria-Hungary, and Spain modified their regulations so as to admit hog products, if they were certified to be free from trichinae.

In the latter part of 1894 various states in Germany and the countries of Denmark, Belgium, and France prohibited the importation of cattle from the United States, giving as a reason the prevalence of Texas fever, pleuro-pneumonia, etc. Since 1870, Great Britain has required that American cattle shall be slaughtered immediately upon arrival. This restriction was brought about by the alleged existence of pleuro-pneumonia in the United States.

United States Meat Found Good

Following the prohibition of American pork by Germany and other countries, the Department of State in March, 1881, investigated various phases of the pork industry in the western states, covering all possible causes which could render the products dangerous to health. In October, 1883, President Arthur appointed a commission of impartial scientists and representatives of the New York Chamber of Commerce and the Chicago Board of Trade, instructing the Commission "to make a searching examination on the spot of all the conditions of the hog-raising and pork-packing industries in the United States, and to follow by the most practical examination the course of this food staple from the fields and farms of the United States to the wharves where it is shipped or to the shop, where it is exposed for sale and domestic consumption."

The result of these investigations was communicated to Congress by the President, accompanied by much diplomatic correspondence and other information bearing on the subject. While it was conceded that trichinosis was found in American hogs, the proportion of animals thus affected was declared to be less than in Europe.

In 1885 Commissioner Norman J. Colman urged upon Congress the importance of vigorous means and measures to protect American cattle interests, because of the existence of pleuro-pneumonia and other contagious diseases which were having a very serious effect upon foreign and interstate com-

merce in livestock. Since the foreign restrictions had been enforced, the exportation of sheep had steadily declined from 108,652 in 1879, to 32,410 in 1884, and that of hogs from 25,033 in 1879, to almost none in 1884. The restrictions upon interstate commerce from the same cause also had been a great burden, and the reduction in the value of cattle in the affected states had been enormous.

First Federal Law

In 1889 Secretary of Agriculture J. M. Rusk, in his annual report made an earnest appeal for legislation which would provide for a federal meat inspection law. While Secretary Rusk repudiated the "captious objections" on the part of foreign authorities to the wholesomeness of our meat products, he added that as long as the government neglected to take precautions universally adopted by the governments of those countries in which a market was sought for surplus products, and left it to the officials of other countries to inspect American live cattle or meats, it was impossible to present as forcible arguments as could be made against restrictions on United States trade. This was especially true when foreign countries could claim with some show of reason, that they had better opportunities for learning of diseases among American cattle than were enjoyed by the American government itself.

The following year, August, 1890, Congress took the first step toward the establishment of federal meat inspection by the passage of a law "providing for an inspection of meats for exportation." This act provided for a careful examination of salted pork and bacon intended for exportation, to determine whether it was wholesome and fit for food, when the laws, regulations, or orders of any foreign government required inspection, or when any buyers, seller, or exporter of such meats requested inspection; and also for the examination of all cattle and sheep for export. Such inspection, it was provided, should be made at the place where the meats were packed

or boxed, and the meats should be stamped or marked after inspection. The examiners were authorized to issue certificates of inspection to the shipper of the meat and to the consignee and also for the Department of Agriculture.

Primarily, therefore, meat inspection by the federal government was begun in the United States, not because Congress had in view the protection of the people of this country from the result of eating diseased meats, but because foreign countries were opposed to allowing American meats to enter their ports for the alleged fear that the people of those countries would suffer therefrom.

Government Inspection Best

Although inspection for export was desirable, the view of Congress was not true as to facts, because it allowed room for a wrong conception that packers would be short-sighted enough to sell poor meats consciously, which policy would in a short time have decreased their business. Bad meats, such as occasionally got into trade channels, were due to accidents. The attitude of Congress was natural, however, at a time when the functions of government were being extended rapidly in many departments. There was failure to realize in entering upon the function of meat inspection that there could not be any other kind of authoritative inspection, and that this would have been a natural and a good thing from the start.

Under the law of August 30, 1890, the United States Bureau of Animal Industry prescribed regulations which required all packers, or exporters, buyers, or sellers of such meats to make application in writing to the Secretary of Agriculture for inspection. Every inspected package of salted pork or bacon was required to be stamped, if found wholesome and fit for human food. Certificates of inspection were issued to the exporters, the consignee, and the Department of Agriculture. Inspectors were required to report daily the number of stamps issued.

It soon became apparent, however, that the law did not meet all conditions. It was the intention of Congress in passing this measure to enact a law which would enable the government so to certify to the wholesomeness of American pork products as to entitle them to entry into foreign countries. The act, however, did not provide for determining the fundamental question as to whether or not the animals from which they came were diseased at the time of slaughter. The consequence was that foreign governments refused to recognize such inspection certificates issued under this act as sufficient to warrant the removal of the prohibition which they had maintained.

Ante- and Post-Mortem Inspection

To remedy this situation Congress passed the Act of March 3, 1891, which provided that the Secretary of Agriculture should cause an inspection to be made, prior to the slaughter, of all cattle, sheep, and hogs which were the subject of interstate commerce and which were about to be slaughtered at slaughter houses, canning, salting, packing or rendering establishments in any state or territory the carcasses or products of which were to be transported or sold for human consumption in any other state or territory. In addition it was provided that:

There may be in all cases where the Secretary of Agriculture may deem it necessary or expedient a post-mortem examination of the carcasses of all cattle, sheep and hogs about to be prepared for human consumption at any slaughterhouse, canning, salting, packing, or rendering establishment in any State or Territory, or the District of Columbia, which are the subjects of interstate commerce.

It should be unlawful further for any person to transport from one state or territory to another, the carcasses of any cattle, sheep, or swine, or the food products thereof, which had been examined in accordance with the law and found by the inspector to be unsound and diseased. Cattle, sheep, and swine slaughtered by any farmer upon his farm and trans-

ported from one state or territory to another were exempted from the operations of this law except in case the carcasses of such cattle, sheep, or swine went to any packinghouse or canning establishment and were intended for transportation to another state or territory, in which case they were subject to a post-mortem examination.

The regulations issued under this act provided for an examination before and after slaughter by veterinary surgeons of all animals slaughtered for export or interstate trade, the condemnation of all animals found to be diseased, and the proper identification of all carcasses and other products entering into these two classes of commerce.

Microscopic Pork Inspection

The regulations also provided for a microscopic examination of hogs after slaughter in order to certify that they were free from trichinae, as Germany and other countries had prohibited such meats on the grounds that they were so affected. When the slaughtered hog was passed into the cooling room the veterinary inspector or his assistant took from each hog carcass three samples of muscle, one from the pillar of the diaphragm, one from the tenderloin, and the other from the shoulder. These samples were put into a tin box and a numbered tag placed upon the hog and a duplicate number on the box containing the samples. They were then taken to the microscopist, who made a thorough examination of each sample, furnishing a written report to the inspector in charge of the killing room. All hogs reported as affected with trichinae were at once removed under the supervision of an inspector from the cooling room and disposed of by tanking or by thoroughly cooking.

First Inspection in New York

The first inspection under these regulations was in New York City at the abattoir of Eastman and Company, May 12,

1891, and was confined to the inspection of their export dressed beef. At the beginning of June, 1891, the work was inaugurated in Chicago, and soon thereafter at South Omaha, Nebraska; Kansas City, Missouri; Milwaukee, Wisconsin; Jersey City, New Jersey; and Hammond, Indiana. The microscopic examination of hogs was commenced at the abattoirs of Nelson Morris and Company, Armour and Company, and Swift and Company at Chicago on June 22, 1891.

The result of this microscopic examination of hogs was an order by the German government on September 3, 1891, removing the prohibition that it had maintained since 1880 against the importation of American pork products. The removal of this prohibition by Germany was followed within a short time by the removal of a similar prohibition by Denmark and later by Italy, France, and Austria. The extent of the inspection service in its beginning is indicated by the fact that in the first full year following the institution of federal meat inspection (the fiscal year ending June 30, 1892), 5,076,929 animals were inspected, of which 3,167,150 were cattle, 59,089 were calves, 1,267,329 were hogs, and 583,361 were sheep. The cost of inspection was from 5½ to 6 cents per carcass and the total expense of the meat inspection service, \$279,508.

The benefits arising from meat inspection, as carried on under the law of 1891, made it apparent that the inspection could be extended with profit. Secretary Rusk in his report pointed out the need of extending the inspection to cover all animals slaughtered for human food, in order, first, to secure to the American consumers most healthful meats, and also to maintain the reputation of American meat products abroad.

Growth of Meat Inspection

By 1894 meat inspection had grown into the most important and extensive part of the work of the Bureau of Animal Industry. The ante-mortem and post-mortem examinations were extended to hogs at the various abattoirs where inspection

had been established, thus greatly increasing the scope of this service. In that year inspection was carried on at 46 abattoirs in 17 cities, whereas in the first year of meat inspection but 22 abattoirs had inspection.

Dr. E. E. Salmon, Chief of the Bureau of Animal Industry, in his report in 1895, suggested that the states provide an efficient method of co-operation by enacting legislation making it illegal to sell for human consumption within each state any meat from animals condemned by federal inspectors, unless the animals were held a sufficient time before slaughter to enable them to recover and become fit food products. This would render unnecessary state meat inspection service at abattoirs which had federal inspection. Such co-operation would make for efficiency.

It was urged that Congress should give the Bureau more and wider power to administer the meat inspection service in supervising the use to which condemned meat could be put legitimately, such as in the manufacture of inedible products, and it was also urged that the operation of an abattoir in the absence of an inspector be prohibited, and that abattoirs should not be opened on Sunday. The managers of some of them at that time and afterwards showed a disposition to kill animals at night, or very early in the morning, or on Sunday without notifying the inspector.

Interstate Commerce Regulations

The Act of Congress of March 2, 1895, amended the Act of March 3, 1891, so as to confer power upon the Secretary of Agriculture to make such rules and regulations as he deemed necessary to prevent the transportation from one state or territory to another, or to any foreign country, of the condemned carcasses or parts of carcasses of cattle, sheep, or swine which had been inspected in accordance with the provision of the law. There was no further enlargement of the Department's and Bureau's powers until 1906, although the

officials recognized their limitations and attempted by recommendations that appear in successive reports, as well as through quiet work of which no record is preserved, to secure legislation that would remedy the lack of jurisdiction.

Although neither the law of 1891 nor the amendment of 1895 mentioned sanitation specifically, the Department in February, 1906, issued a rule demanding greater cleanliness in all parts of the packinghouses and the installation of regular toilet rooms. Progress was being made in this line when the agitation of 1906, considered in another chapter, directed public attention to the inadequacy of laws on the subject and brought about the enactment of the law of June 30, 1906. The so-called "revelations" of that year, however, were in some respects exaggerated and incorrect, but such defects and limitations of the laws under which the inspection had been conducted as existed up to that time were thoroughly realized by the Department. Several efforts had been made to procure new legislation and increase appropriations in order to extend the inspection and improve its efficiency. The disclosures of unsatisfactory conditions in the packing industry in 1906 related almost wholly to canned and prepared meats, the use of preservatives, and the unsanitary condition and methods of many packing establishments. These, however, were matters over which the Department, up to that time, had no control.

Meat Inspection Act of 1906

The Meat Inspection Act of 1906 took effect on July 1 of that year, except that the provisions regarding the transportation of meats did not go into effect until October 1. It conferred upon the Secretary of Agriculture greater power and increased from \$800,000 a year and made permanent an annual appropriation of \$3,000,000 to pay the cost of inspection, enabling the Department to extend and strengthen greatly the inspection service.³

³ Previous to this the annual expense for inspection was \$800,000.

Under this law the inspection was applied not only to the live animals before slaughter and to the carcasses immediately after slaughter, as was the case under the former law, but afterwards to the meats and meat food products in all the stages and processes of preparation, curing, canning, etc. The Department of Agriculture was empowered further to require sanitary equipment, conditions and methods in the slaughtering and packing establishments, to prevent the use of harmful chemicals and preservatives and of misleading labels, and to regulate the transportation of meat in interstate and foreign commerce. This law applied only to cattle, hogs, sheep, and goats, and to the carcasses and meat food products of these animals. Poultry, fish, and game were not subject to inspection.

Installing Inspection

Meat inspection under this law proceeds by logical steps. Meats or meat food products, except those of farmers, retail butchers, and retail dealers, cannot be shipped from one state to another or abroad unless they bear the official meat inspection marks. A person or firm desiring to make such shipments must, therefore, make application to the Department for inspection, stating the extent and character of the business expected to be done. The Department, as directed by the law, sends its experts in sanitation who report to Washington with recommendations.

Usually changes are required in sanitation or in facilities for conducting inspection. The Department points out necessary changes, and its requirements are in accordance with broad and well-known principles. It requires that each room used in the ordinary processes be well lighted and ventilated; that ceilings, walls, and floors be of such material as can be easily cleaned; that toilet and dressing rooms sufficient in number and ample in size be provided and be fitted with modern lavatory equipment, including running water, soap, and towels.

Such rooms must be properly ventilated and lighted and be entirely separate from the compartments where carcasses are dressed or meat handled.

The premises about the plant and belonging to it also come in for attention. The yards, pens, alleys, and chutes must be clean, and the former common practice of fattening hogs or other animals on the refuse of the slaughter houses is forbidden. When reports show that the packer has put his plant in proper condition, the Bureau assigns an official number to the establishment, details a sufficient number of inspectors to conduct the inspection, and business may proceed.

Cleanliness a Requisite

This, however, is not all there is to the sanitation required by law. A slaughter house gets dirty with great rapidity; like a small boy, it requires constant cleansing. It is necessary that ceilings and walls be frequently scrubbed and whitewashed or painted, and that trucks, trays, and other receptacles, chutes, platforms, racks, tables, and all tools used in moving, handling, chuting, chopping, mixing, canning, or other processes be thoroughly cleaned each day. The employment of anyone who has tuberculosis or other communicable disease is forbidden. Clothing which comes in contact with the meat should be of a material that is readily laundered, and it should be cleansed each day. Many of the larger packers have established laundries and provide their workmen with fresh outerclothing daily. Personal cleanliness on the part of the workmen is insisted upon, and to such an extent is this carried that some establishments employ professional manicures who daily treat the hands of the girls handling such products as chipped beef.

In this matter of cleanliness and sanitation many of the packers throughout the country had been proceeding with improvements as a part of their regular business. For they had found out that nothing enters into competition in the pack-

ing business more than does sanitation. Accordingly, packers, in order to get ahead of their competitors, improved sanitary conditions. The government furthered this and set standards of general application.

Actual Inspection Procedure

As conducted at present, the first step in actual inspection is the examination of the living animal by government inspectors in the stockyards or in the pens and alleys of the packing company by which the animals have been brought and in the slaughter house of which they are to be slaughtered. No animals which have not undergone this examination are allowed to enter the slaughter house proper.

The inspector goes into one of these pens containing anywhere from 100 to 200 animals and looks over each one carefully. When he finds one that to his mind is not perfectly sound and healthy he, or his assistant, affixes to its ear a numbered metal tag bearing the words "U. S. Suspect." Such animals are segregated and slaughtered separately from other animals, either before or after the regular course of the killing. If the post-mortem examination does not confirm the inspector's suspicions, and no lesions of disease are found, the tag is taken off and sent to the office of the inspector in charge of the station, who had already been informed of the number of the tag after it was affixed on suspicion, and the carcass is sent along as edible meat. If lesions which warrant condemnation are found, the carcass is sent to the tank, the tag being removed and taken with a report to the office.

"Knocking Cattle"

Animals which have been found by the inspector to be sound and healthy on the ante-mortem inspection are not marked, but proceed by runways into the slaughter house itself and to the killing floor, which for cattle is usually at the

top of the building.⁴ The cattle go into narrow enclosures, called "knocking pens," from one to five to a pen. The knocker walks on a platform above and with a long-handled hammer shaped like a riveting hammer strikes the animal on the head. As it falls stunned the side of the pen opens, but the door of the pen is only opened far enough so that the tilting of the floor will slide the animal's legs through the opening for shackling. After the shackling has been done the door is opened entirely and the floor tilted completely to make the animal roll out on the dressing floor, or "killing beds," a foot or so below. The animal is then hoisted and hung from the rail of an overhead traveler.

In this position the sticker bleeds him by a longitudinal incision that severs the principal blood vessels in the neck. When the blood is used for food purposes it is caught in a numbered receptacle and held until the carcass is further examined. The overhead traveler now carries the animal forward, and workmen skin the head and cut it off, placing it on a rack and marking it so that it can be identified, should cause for condemnation be found elsewhere in the carcass.

A string of butchers now follow each other in rapid succession. The "leggers" remove the hind legs at the hoof and the forelegs at the knee. The "sider" skins the animal down as far as he can work toward the floor. The "caul puller" cuts the carcass from throat to anus, removing the caul fat from the abdomen and placing it in a box, which is numbered for identification. Another butcher loosens the trachea and saws through the sternum. Still another butcher skins the buttocks and usually cuts off the tail, which is also marked for future identification.

The carcass is now hoisted clear of the floor and the "backer" finishes the skinning. At the same time the "gutter" is at work removing the viscera. The rump sawyer then takes

⁴ This description applies especially to the typical large establishment with modern equipment. While methods and details may vary in the smaller houses the inspection is carried out on substantially the same principles.

the eviscerated carcass and divides it from the coccyx to the lumbar vertebrae. The "splitter" follows with his cleaver and continues the splitting to the base of the neck. The neck man or hide dropper finishes cutting the hide from the neck, after which another butcher splits the cervical vertebrae, thus separating the halves. Trimmers then cut off the ragged pieces of flesh, remove the spinal cord, and pump the blood out of the forequarters by rapidly moving the forelegs up and down.

Looking for Infection

On severing the head the glands are first exposed and as these are common seats of tubercular infection, a federal inspector makes an examination for evidence of disease, if necessary cutting into the glands himself. Another inspector stands at the elbow of the gutter and as the viscera are revealed, watches with practiced eye for abnormalities, carefully examining and handling the various parts in order that any obscure indication of disease may be discovered. The law requires this inspector to handle the viscera, and if necessary, to cut into them. This is rapid as well as exacting work, and the head and viscera inspectors frequently exchange places, or the viscera inspector is relieved by another after two hours' work.

When the inspector finds a diseased carcass he attaches to it by means of a wire and seal a paper tag with the words "U. S. Retained" on it and numbered to correspond with the number on the stub from which it is taken. He sends the numbered stub to the office with his report. The carcass, with the parts that have been separated, none of which is allowed to lose its identity, is now sent directly to a compartment called the "retaining room." This important room must be rat proof, well lighted, have floors of cement, or of metal or brick laid in cement, and be provided with facilities for locking. There is a special lock for the room, and the keys remain in the custody of the inspector. At convenient periods the

retained carcasses undergo in this room at the hands of other inspectors a more leisurely and careful inspection.

Final Inspection

This is the final step in the post-mortem examination. The inspectors here have a good deal of personal discretion. Certain definite rules are laid down by the Bureau, but something must be left to the judgment of the inspectors. They must pass upon the question of the extent of the affection and decide whether or not the whole carcass or only parts of it should go to the tank. Not being pushed by the exigencies of the rapid work on the killing beds and the necessity of keeping up with the never-ending stream of carcasses, they are deliberate and careful in making their examinations and in forming their judgments. Carcasses which they decide to be fit for food, they permit to be removed and placed with other healthy carcasses, which have been passed on the first inspection. They take off the "U. S. Retained" tag, return it with their report to the office, and stamp it "U. S. Inspected and Passed."

When the examination confirms the suspicious indications of the first examination, however, they stamp conspicuously on the carcass, also on the tag, the words "U. S. Inspected and Condemned." The carcass is removed immediately from the retaining room under the eye of a government employee and goes either to the tank, or, if it is not convenient to tank it immediately, to the condemned meat room. This, like the retaining room, is provided with a lock, the key of which is kept by a government employee, and which is opened only by government employees. As soon as practicable, government men remove the carcass to the tank, keeping a record of the tag numbers, which they forward with their reports to the office. At houses which do not provide a "condemned room" the carcass is sent directly to the tank. About 25 per cent of the carcasses retained are condemned.

All carcasses, both fit and unfit, having been removed from

the retaining room, the floors and walls are washed with hot water and disinfected in order that the room may be clean and free from disease infection for the reception of the next batch of retained carcasses.

To return to the killing floor and to the carcasses with which the inspectors have found nothing unhealthy, the overhead traveler carries the separated halves along out of the way of the other operations, and other workmen subject them to a thorough washing with very hot water, usually from a hose, or from an ingenious combination of hose, pipe, and brush, and wipe them dry with clean towels. During this process the hanging halves slowly approach the chill room over a mechanical conveyor.

"The Little Purple Stamp"

Just before entering the chill room the halves are marked with the inspection legend in five places or more on each side of beef, usually on the loin, rib, chuck, plate, and round. The marking is done by means of a metal or rubber stamp and a purple indelible ink, and the words thus stamped are "U. S. Inspected and Passed," or an abbreviation of these words, with the establishment number. The number is one assigned to the house by the Department at the time inspection is begun. It is registered in the Department records, and besides serving as a convenient means of reference it provides a sure method of tracing meat about which questions may subsequently arise.

This mark is absolutely necessary under the law to procure the movement of the meats between states, for the law forbids carriers to transport from one state to another any meats that are not so marked, except the meats of farmers and of retail butchers and dealers. The federal law does not, and of course, cannot, forbid the carrying of unmarked meats inside of a state, so that in the absence of state laws the carriers may, unmolested, carry any kinds of meat from one part of a state to another.

The sides now pass to the chill room, where they are held at a temperature of about 36 degrees Fahrenheit, for 48 hours or more before being shipped out. The head, tail, caul, and liver are removed to other parts of the plant. On modernly appointed killing floors the offal or "fancy meats," as it is now called in the trade, is removed by means of chutes. During the entire process of slaughter the meat has not been allowed to touch the floor. When the inspector has detected disease in a carcass and attached the "Retained" tag to it, he orders the butchers, before they proceed to another carcass, to cleanse their hands of all grease and to immerse them in a disinfectant solution, usually bichloride of mercury, 1 to 1,000. He sees that all tools and implements used in the suspected carcass are likewise cleaned of grease and immersed in boiling water or in a disinfectant solution. For this purpose disinfecting tanks are now in general use, provided with three compartments, one of hot water to take off the grease, a second with the bichloride of mercury solution, and a third with hot water for final rinsing.

The slaughter of calves, sheep, and goats, follows generally the plan for cattle, sheep often being killed at one end of the beef killing floors.

Hog Slaughtering

The slaughter of hogs, however, is entirely separate and the processes are different. In the larger houses where 300 to 500 hogs are killed in an hour the slaughtering proceeds as follows:

A group of hogs is herded in a pen, through one side of which revolves a huge wheel or hog hoist with stout hooks set near the outer rim. Men go into the pen and deftly attach the loop of a chain to a hind leg of the hog and hang the other end of the chain to a hook on the wheel. The hoist slowly elevates the animal, and at the top the chain automatically passes to an inclined rail. The hog hanging head down,



Figure 18. United States Inspected and Passed Beef

passes to a sticker, who at one stroke severs the larger blood vessels of the neck.

When the animal is dead the carcass is dropped into a great vat of scalding water, where it is poled from one end to the other. Long finger-shaped hooks then lift the body and pass it on to an automatic scraping machine, known as a "dehairer," which speedily removes most of the hair. Emerging from this, the carcass drops onto a moving platform, which carries it before a butcher, who almost severs the head, exposing the cervical glands, where about 93 per cent of the cases of tuberculosis are detected.

Gland Inspection

Beside the butcher stands a government inspector, who examines the glands, feels them, and, if necessary, cuts further with his own knife. Quick and accurate work is demanded here. If he detects disease he marks the carcass, sometimes with a black cross on the fore quarter, sometimes by severing the ligaments of the foreleg. Beside him is a pail of disinfecting solution into which he thrusts his knife before the next hog reaches him.

The animal thus marked passes on with the others, gambrel sticks are affixed, and the carcasses are hung on the overhead rail and subjected to washing and further scraping. Here the marked hogs leave their fellows. A government employee switches them to another rail, attaches the "U. S. Retained" tag, and sends them along to the retaining room. Those carcasses, the head examination of which has shown no disease, pass on the regular rails to the gutters, who disembowel them. The carcass and the viscera of each animal pass before another skilled inspector, who has to sit close to his work and handle each set of viscera for evidence of disease. This found, he tags the carcass "Retained" and it is switched to the retaining room, the viscera likewise being tagged and sent with the carcass.

The carcasses which have thus far passed the head and visceral inspections and have shown no sign of disease proceed along the rail and are split in halves. Inspectors examine the freshly cut halves, and sometimes find lesions in the bones or muscles, in which case also the carcass is marked for the retaining room. The process from this point to the finishing of the carcass is the same as that detailed for cattle. The untagged animals are allowed to pass through the shower bath, are labeled, and go to the cooling rooms, while inspectors make a closer examination in the retaining room of those carcasses which have been held as suspicious and determine whether they should be allowed to pass unconditionally, be made into lard, or be sent to the offal tank.

Two Post-Mortem Examinations

Briefly contrasting the two separate post-mortem examinations—that on the killing floors and that in the retaining room—it is noted that the floor inspectors have a very limited discretion. Their orders are to hold any carcass that shows the minutest lesions of disease. The business of both the head and viscera inspectors is to find the disease and to stop the carcass then and there for a further inquiry. Once disease is found, or something that looks to the inspector like disease, the carcass must be retained.

On the other hand, the inspectors in the retaining room take their time. It is their duty to examine into the extent of the disease, and in the light of modern knowledge, to judge whether it is local or general, whether or not it unfits the meat for human food, and whether or not the fat may be allowed to be rendered into lard at a prescribed temperature.

The Department provides a sufficient number of inspectors for this work and insists that they be furnished every facility in the way of space and light. Here, as elsewhere, it seeks to accommodate its inspection to the business of the owner of the abattoir. Within reason it requires its men to work as long

as the plant is operating, to begin as early, and to continue as late. The inspectors work as fast as the improved appliances of the establishment permit or as its needs demand, and the Bureau does not require the proprietor to stop his work to send for the inspector or to wait while the inspector returns to his office and makes out an elaborate report—a procedure which is common in the inspection systems of some foreign countries. It requires only that notice be given of the hour that work is to begin, and its men are on hand. In short, the Bureau of Animal Industry specializes in its inspection service, and is as modern and as up to date as the well-organized business it supervises.

At this point—with the killing of the animal—previous meat inspection laws practically stopped. The Department formerly contented itself with placing labels on canned goods, stating that the meat was from animals healthy at the time of killing.

Inspectors in All Departments

The present law, however, goes further, and inspectors are on duty in the other departments of the meat packing plants, and all meats in further process have to carry the marks indicating previous satisfactory inspection. This applies to curing, pickling, smoking, cooking, canning, or the manufacture of sausage. These inspectors having satisfied themselves that the meats have been passed, make another careful examination to assure themselves that the meats have not spoiled, or become unclean since the inspection at the time of slaughter. Such as have undergone changes that make them unfit for food they reject, obliterate the inspection mark and destroy. They then supervise the entire preparation, and require all fixtures and appliances, such as tables, trucks, trays, vats, machines, implements, cans, or containers, of any kind, to be clean and kept clean.

The inspectors also insist that no drugs, chemicals, or col-

oring matters be used, and no preservatives except salt, sugar, vinegar, wood smoke, and other specified ones.⁵ An exception is made in the preservative line, in accordance with the meat inspection law, however, to the extent of allowing a manufacturer to pack export meats in accordance with the directions of the foreign purchaser when the use of such preservatives as he prescribes does not violate the laws of the country to which the meat is to be exported. For example, England made no objection to the use of borax; consequently meats sent to England may be preserved with borax, but they must be prepared in separate rooms and marked with special labels showing that they are for export only.

Canned Meat Inspection

The preparation of the immense output of canned meats is supervised in the same manner. Inspectors are present at all the processes between the arrival of the meat and shipment of the canned product, and making certain purity and fitness in the materials and cleanliness in workers, workrooms, and utensils. As a further safeguard the Department has equipped and maintained branch laboratories at the points of greatest output. Here, with microscopes and reagents, special experts examine the salt, the spices, the pickling fluids, and the fats and oils used, with a view to detecting any forbidden preservatives and coloring matters. In short, they bring to the aid of the inspectors the best efforts of modern bacteriological and chemical science. Samples of the finished product are taken at random from stocks, and are even purchased from retailers at distant points. Even the water used, not only here but also in washing carcasses, must pass analytic scrutiny; and several houses accustomed to drawing their supply from contaminated sources have had to abandon the practice.

Having inspected the meat "from the pasture to the package," the inspectors go a step further, and see that the package

⁵ These are allowed after a full investigation to determine whether they are lawful.

is properly and honestly labeled. The law carefully regulates the trade labels that go on the packages, and the Department lays down the broad rule that the label shall tell what is in the package. It has been usual, for instance, to label many mixtures as "potted ham" or "potted tongue" or "deviled" or "minced" ham or tongue. At present, if these labels appear, the can must contain only ham or tongue. Some hams used to be labeled "Westphalia ham," or "York ham," the inference being that it came from Westphalia, Germany, or York, England, localities famous for their ham products. These hams now appear as "Westphalia style," or "York style," or "York cut" hams. Packages now labeled "pure lard" must be made of sweet, clean, clear hog fat, with the addition of not more than 5 per cent of lard stearin, in order that the lard may not easily melt in hot weather, and "kettle-rendered lard" must be actually so rendered.

Unfit Carcasses Destroyed

The Meat Inspection Act orders the Secretary of Agriculture to destroy for food purposes all carcasses or parts which are found unfit for food. All large establishments provide tanks for this purpose, because in this way grease may be saved for soap and other non-edible products, including fertilizers. Tanks vary in size with the size of the establishment and its volume of business. They are of metal and extend through two or more floors of the plant. From the nature of their usage they must be very strong and tight.

Government employees first seal the lower opening of the tank. They then see that condemned carcasses, parts, and meat products are put in, along with offal or coloring matter. They close and seal the top, closing and sealing the draw-off valves, have the steam turned into the tank, and require it to be maintained at a certain pressure, usually 40 pounds, for a prescribed time. This produces a temperature of 280 degrees F., which is maintained for 8 or 10 hours, and is sufficient to

liberate all of the grease and even to disintegrate the bones.

Inspectors watch also the drawing off, which is done by means of valves, located at intervals along the sides of the tank, and they mark the containers in which the product is stored and shipped with the word "inedible." All possible precautions are taken to prevent this grease, some of which looks about as good as some lard, from going into trade as edible product.

Inspection Law Stringent

Thus the meat inspection law is an advanced and stringent measure, and the regulations of the Secretary of Agriculture made under it more fully carry out the intent of the law. Other safeguards are also stipulated. The law provides for a fine of not less than \$5,000 and imprisonment for at least a year for any man who gives anything of value, even a piece of meat, to a government employee to influence him in the performance of his duties. Regarding such employees it holds over them the menace of similar fine and imprisonment if they accept anything of value, no matter what the intent of the donor or the purpose of the gift may be.

The Bureau further places obstacles in the way of collusion between inspector and owner by frequent changes at the larger stations of employees from plant to plant, and by changes less frequent, of employees from station to station. It is working constantly, also, to secure uniformity in the inspection of all stations, by a complex system of reports, which its experts scrutinize with a view to discovering abnormalities in results and making the proper corrections.

The personnel of the meat inspection service is divided into two general classes: professional and non-professional. The professional is composed of veterinary inspectors, laboratory inspectors, and architect, and a sanitary engineer. The non-professional consists of employees designated "lay" inspectors. The veterinarians must be graduates of accredited veterinary

colleges and must pass the civil service examination for the position of veterinary inspector in the service. At each meat inspection station an inspector is selected to take charge of the work. He reports directly to the Chief of the Bureau of Animal Industry. At stations where slaughtering is conducted only veterinary inspectors are placed in charge, who look after or supervise the regular ante-mortem and post-mortem inspections and perform all of the final post-mortem inspections or examinations. The laboratory inspectors are chemists and also must pass an examination in accordance with the civil service requirements. They make the laboratory tests and inspections.

Lay Inspectors

The lay inspectors are designated lay inspector, grade 2, and lay inspector, grade 1; they are also required to pass the civil service examination. Lay inspectors, grade 2, are experienced and well informed in regard to packinghouse operations; they supervise the curing, preparation, and marking of meats and products. They are trained in passing on meats and products as to soundness, and they conduct the inspection and reinspection of such meats and products.

The lay inspectors, grade 1, are required to have at least three years' experience in handling food-producing animals before taking the civil service examination. Their duties are to assist the veterinary inspectors in the ante-mortem and post-mortem inspections, and to perform other duties similar to those described for the lay inspectors, grade 2. After a certain period of service they are eligible for examination for promotion to the position of lay inspector, grade 2. It is the duty of every employee, whether veterinary inspector or lay inspector of either grade, to see that the sanitary regulations are observed in their respective departments.

Certain veterinary inspectors, selected for their experience and general qualifications, are known as "traveling" veterinary

inspectors. They inspect the official stations and establishments in their respective territories and report to the chief of the Bureau whether the regulations and instructions governing meat inspection are properly observed. Their visits are unannounced and their reports are valuable in the effort to secure a uniform inspection and the enforcement of the sanitary regulations.

The personnel at present consists in round numbers of 800 veterinary inspectors; 1,000 lay inspectors, grade 2; 700 lay inspectors, grade 1; and laboratory inspectors, administrative officers, and clerical forces to bring the total to about 2,650 persons.

Economic Importance of Inspection

The economic importance of the federal inspection of meats and meat food products may be summed up as follows:

It is the instrument by which an important part of the export commerce of the United States has been secured and preserved.

It is a service in hygiene and sanitation of incalculable value to the country at large.

It is the most thoroughly equipped agency through which may be gathered the data necessary to the success of any broad program having for its object the conservation of the national meat food supply through the eradication of damaging and destructive diseases from the food animal herds of the country.

As showing that the federal inspection of meats is a service in hygiene and sanitation of incalculable value to the country at large, and that this service is performed at an extremely low cost, the following facts and figures are cited:

The government maintained inspectors in 892 establishments in 265 cities and towns in 1921. Inspection was inaugurated at 62 plants and withdrawn from 61 during the year. It was discontinued at 47 of them because of the stopping of

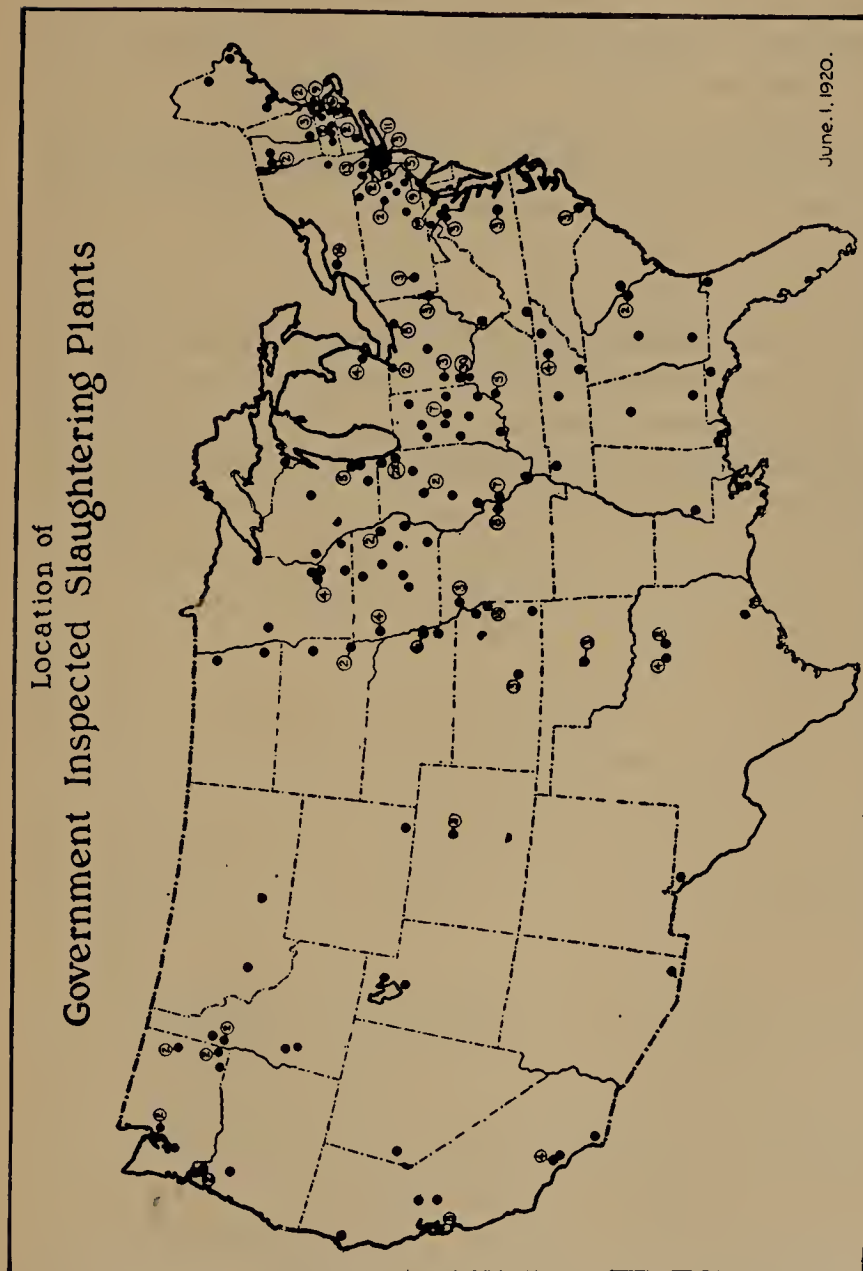


Figure. 19. Map Showing Location of Government-Inspected Slaughtering Plants
The figures near the dots indicate the number of inspected plants at that point

slaughtering or of interstate business, at 5 by request, at 5 on account of being consolidated with another official establishment, and at 4 on account of violations of the meat inspection regulations or insanitary conditions. During 1921 the government inspectors examined 62,252,442 animals at packing plants, including cattle, calves, sheep, goats, swine, and horses, and 189,874 were condemned. Of the animals slaughtered at these plants, 8,179,572 were cattle, 3,896,207 calves, 12,452,435 sheep, and 37,702,866 hogs, and this service cost less than 6 cents for each of the animals slaughtered.

This survey indicates that the federal inspection of meats and meat food products destined for commerce possesses great economic importance for the packing industry which made it possible and is of untold value by its service in the field of hygiene, sanitation, and protection of the health of the people.

CHAPTER XVI

PACKINGHOUSE BY-PRODUCTS AND CHEMICAL CONTROL

By-Products and Chemists

The production and manufacture of by-products is today one of the most frequently discussed phases of the meat packing industry. Their importance has been pointed out by the larger packing companies themselves by showing the relation of by-products to profits, which indicates that by-products are the gold mine of the industry. But they are a comparatively recent development, and are due to the introduction of chemists and chemistry into the business. This introduction of the chemist and chemistry was a turning point of the packing industry, according to President Thomas E. Wilson of the Institute of American Packers, in an address before the American Chemical Society Convention in September, 1920. "The chemist has turned into practical channels of income what was in former times not only waste, but a source of expense for its removal."

With chemistry there came chemical control as a vital factor in large-scale meat packing, for the industry's business policy has been determined since then with more scientific regard for the possibilities of by-product development. Its influence has extended far beyond the actual manufacture of by-products. The period since chemical control was inaugurated has been characterized by more thorough, competent, and scientific management and operation of the business in all of its branches. There is now more complete and thorough organization, more thoroughly trained personnel, a more com-

plete and accurate knowledge of the business—all of which make for prompt and better service in every section of the country. Were it not for the ingenuity of the chemist in finding a way to utilize the offal of slaughtered animals, the price of meat would necessarily be very high.

Early By-Products

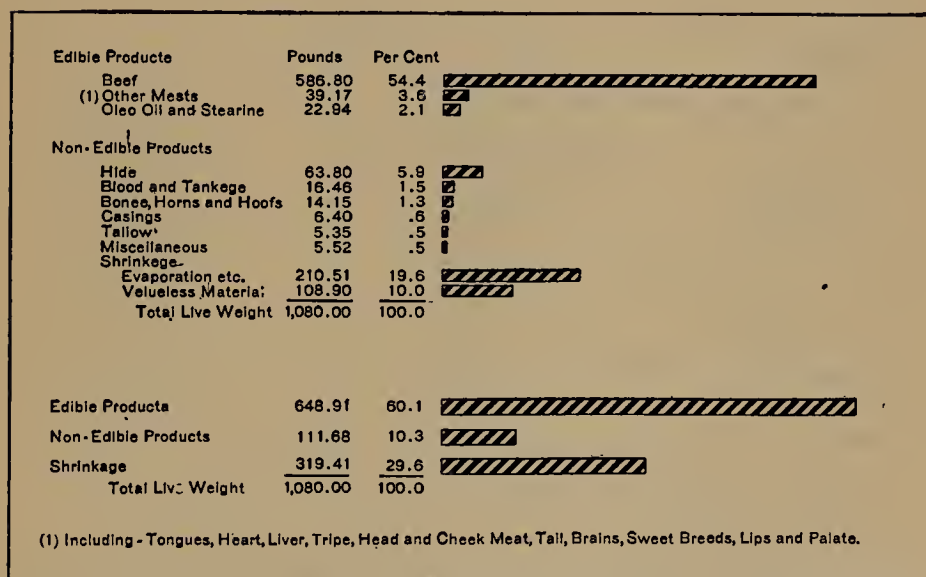
There had always been certain by-products in the meat packing industry, as has been seen in the chapter on the technique of packing in pre-refrigeration days, when pork packing was the most important phase. To mention them again, the principal by-products before 1875 were lard, lard oil, tallow, soap, glue, fertilizer, bristle-dressing, some of which products were not made by the packers themselves, but were nevertheless by-products. In Chicago in 1863 hog packing products consisted of bristles, lard, mess pork, hams, shoulders, bacon, lard oil used in lamps and lard stearin used in making candles. While there was a certain amount of utilization of by-products for many years before the scientific awakening which took place in the eighties, it had been done by comparatively loose, rule-of-thumb methods. There had been just enough easy money realized out of by-products at times when conditions were favorable, and hard-earned money lost when they were unfavorable, to arouse the minds of thinking men and show them the chances of greater profits.

Since much misinformation is in circulation concerning the rôle of by-products in packinghouse existence, it is well to consider briefly at this point the proportional part the raw by-products play in the credits to each individual animal slaughtered, and the use to which these various raw by-products are put.

Steer By-Product Percentages

It is not possible to obtain directly comparable figures for all classes of livestock, due to the differences in utilization of

the various parts of the different animals, with the attendant differences in accounting methods, but the failure to be comparable exists only to a slight degree. For the quarter ending June 28, 1920, at Armour and Company's Chicago, Kansas City, Omaha, St. Louis, Ft. Worth, Sioux City, St. Joseph, St. Paul, and Denver plants, 201,213 head of cattle, omitting calves, were killed. The meat from these animals totaled in value \$18,230,488.13, an average of \$90.60 per head. The

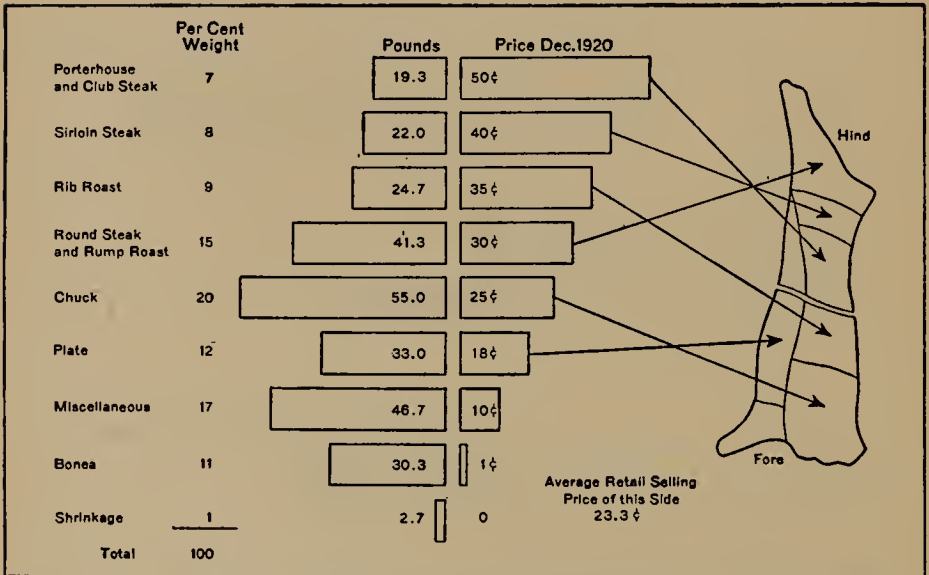


Courtesy Commercial Research Department, Swift and Company
Figure 20. Chart Showing Percentage of Beef and By-Products from a 1,080-Pound Steer

hides totaled in value \$2,865,403.31, or \$14.23 per head. All by-products, both edible and inedible, totaled \$1,555,780.51, or an average of \$7.73 per head. For the steer, this would make 80.5 per cent of the credits apply to the meat, 12.6 per cent to the hide, and 6.9 per cent to the by-products. Of these by-product credits for the steer, nearly 43 per cent is for oleo fats.

It will be noted that the hide is considered separately from other by-products of the industry, as both hides and pelts were

of relatively high market value before the era of the modern packinghouse. Another calculation made by Swift and Company for the year 1920 shows that there was paid out an average of \$93.85 per head of cattle, and there was received only \$83.31 for the meat and \$21.17 for the hides and other by-products. This made total receipts of \$107.48 and left a margin of \$13.63 to cover expenses and profits.



Courtesy Commercial Research Department, Swift and Company

Figure 21. Chart Showing Weights and Prices of Retail Cuts from a Side of Beef

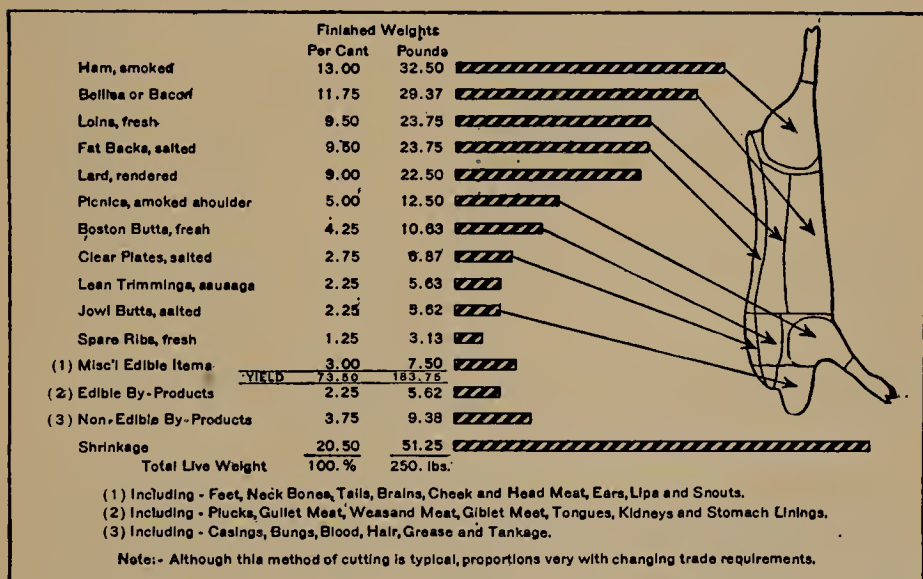
Weight 275 pounds, wholesale price 17.25 cents per pound

The expense of plant operation, freight to market, and branch house expense, amounted to \$2.75 per hundredweight, or \$13.69 per head. This actually left a loss during 1920, not including interest, of 6 cents a head, or approximately 1 cent per hundred pounds of beef. Of course 1920 represents a rather poor year for business, the question of profit and loss depending upon the constantly changing markets for the various by-products. A clear idea of the relative quantities of beef and pork and their by-products is given in Figures 20, 21,

and 22, which show the amount of products in pounds and in percentages of the whole animal.

Hides

Hides are divided into two great subclasses: packer hides and country hides.¹ Packer hides are taken off uniformly, are cured and stored under standard conditions, and are usually available in such numbers that purchasers may secure several



Courtesy Commercial Research Department, Swift and Company

Figure 22. Chart Showing Percentage of Pork Products from a 250-Pound Hog

thousand of one grade of hide. On the other hand, country hides are removed according to the idea of each individual skinner, and are usually imperfectly cured and stored, always show greater percentages of cuts and gashes, and are never on the market in sufficiently uniform grades to allow narrow selections of any number in a given grade.

Packer hides are divided into subclasses as follows:

¹ This information on hides is taken from the monthly letter, May, 1921, of Mr. Edward N. Wentworth, Director, Armour's Livestock Bureau.

AVERAGE CURED WEIGHT (Lbs.)

Steers:

Natives:

Spready.....	Minimum width	6 ft. 6 in.	
Heavy.....		60 up	62-65
Light.....		50-60	54-55
Extreme Light.....		25-50	40-45

Branded:

Butt branded.....		50 up	60-65
Colorados (side branded).....		50 up	60-65
Heavy Texas.....		60 up	63-65
Light Texas.....		50-60	55-56
Extreme Light Texas.....		25-50	40-45

Cows:

Natives:

Heavy.....		55 up	60
Light.....		25-55	42-48

Branded.....		25 up	43-55
--------------	--	-------	-------

Bulls:

Natives.....		25 up	70-85
Branded.....		25 up	70-85

Calves:

Kips.....		15-25	
Packer Calves.....		Under 15	
Slunks.....	Sold by the piece		

Spready native steer hides are measured from brisket to brisket as the hide is stretched flat; that is, the measurement corresponds to the girth. Spready native steer hides are used for automobile, carriage, and furniture leather. Heavy and light native steer hides are used for harness and belting leather. Extreme light native steer hides are used for upper and belting leathers. All branded steer hides are used for sole leather, as are branded cows. Heavy native cows are used for harness, automobile, and furniture leather, while light native cow hides are used for case and bag leather, harness, upper leather, and belting.

Country hides are classified as follows:

	WEIGHT (Lbs.)
Heavy:	
Steers.....	60 up
Cows.....	60 up
Bufs.....	45-60
Extremes.....	25-45
Bulls:	
Branded:	
Side branded country packer.....	25 up
Side branded country.....	25 up
Calfskins:	
Kips.....	15-25
Calf.....	8-15
Light Calf.....	Under 8
Deacons.....	Under 7
Slunks.....	Sold by the piece
Horsehides	
Hogskins	

Horsehides are sold by the hide and not by weight, while hogskins are sold by the pound.

Dry hides are not normally an important factor in the American hide market, but South American hides are marketed dry in relatively large numbers, due to the relative permanence of the hide in that form. The cost of gathering for market in the United States, however, is such that producers today get practically nothing for their dry hides. Fallen hides are those removed from dead animals, while glue hides are those unfit for tanning. Dry hides are classified as follows:

Heavy westerns
Light westerns
Kips
Calf
Fallen
Glue hides
Dry salt hides

To indicate in a graphic way the extent of packinghouse by-products today a representative list, summarizing them, is given at the end of this chapter.

Early By-Product Waste

Returning to the historical development of by-products, the instances of waste before refrigeration came into use were appalling. Before 1875, when no meat product aside from the main carcass (which was susceptible of curing) was considered worth saving, there are cases on record where the whole heads of hogs were buried in carload quantities, merely to get them out of the way and to facilitate the conduct of more important business.

An instance of this kind occurred a number of years ago, when in excavating for the foundation of a modern packing-house in the Union Stock Yards in Chicago, the workmen came upon a great quantity of gummy unworkable material which had to be removed in its entirety before further excavation was possible. The obstruction proved to be the remains of several thousand heads of hogs, which had been discarded and dumped into a trench by some old-time packer as the most practical and expeditious way of getting rid of them, in a great effort to get a quantity of pork on the market. Being composed of fat they had resisted decay to such an extent that they were, even at the time of their removal, considered worth the trouble of rendering, and the grease which resulted proved quite profitable for the rendering concern which came and took them away. This was the state of affairs before the day of conservation of resources.²

A distinct but feeble agitation in favor of sounder and more economical methods of business in the United States began during the first few years after the Civil War. Experimenters in some of the packinghouses throughout the country tried out methods of refrigeration as a means of preserving meats in a fresh state, as distinguished from preservation by means of pickling in brine and smoking. It was this lack of effective and extensive refrigeration facilities previous to the middle seventies which was primarily responsible, not only for

² *The National Provisioner* (Jan. 16, 1915), Vol. LII, No. 3.

the enormous waste up to that time, but also for the fact that slaughtering was possible only during the winter months. In the absence of either chill rooms or refrigerator cars, the only forms of meat known to commerce or recognized on the boards of trade were those of brine pickle and dry salt.

Refrigeration Aided By-Products

By the seventies these difficulties were beginning to be controlled to some extent and small ice boxes were being constructed everywhere, which really enabled some of the packers to do a slight local business in fresh meats. It also made it possible for them to save certain of the more important by-products from deterioration for a sufficient length of time to give opportunity for their proper disposal over the butchers' block or otherwise.

A very important development of 1876 from a meat packing point of view was the engagement of Joseph Nicholson, a packinghouse architect, to construct for P. D. Armour the first large refrigerated meat warehouse in the world. From the start this proved to be a success and enabled Armour to turn to very good account a number of the more valuable by-products of his business, which had been formerly thrown away. Other packers quickly followed his example.

Chemists and Chemical Control

This was the state of things when the scientists first began to appear on the scene and the new methods indicated the great possibilities of chemistry and chemical control. Thus the idea of maximum utilization of animal by-products is little more than forty years old. The evolution of this industry to the high degree of efficiency which it enjoys today has received an added impetus from each of the following influences, which are named in the order in which they became chronologically effective: first, the necessity of economically disposing of vast quantities of animal waste; second, an effort to recover enough

in the value of the crude products resulting from the processing of these wastes to defray the costs of handling; third, the desire to make it a profit-producing enterprise; and fourth, the readjustment of the packing industry to meet the changed economic conditions. These factors in the main have brought the conservation and utilization of animal by-products to their present status.

A Series of Industries

The modern large packinghouse is composed of a group of industries. The meat packing phase itself consists usually of the slaughter of animals, resolving the carcasses into various commercial cuts, curing, smoking, canning, assorting the various by-products and their conversion into finished products, the manufacture of sausage and other meat food products, etc. In addition to this, large packers are engaged in a number of specialized industries on a good-sized commercial scale, which are distinctive in themselves, e.g., the cottonseed oil industry, the poultry industry, the manufacture of "compound" (a substitute for lard), oleomargarine, fertilizers, both animal and mineral, sulphuric acid, glue, hair felt, curled hair, anhydrous ammonia, creamery butter, canned specialties, soda fountain products, soap and toilet specialties, pharmaceuticals, and so on.

Blood and Bones

In the late seventies a means was found for turning to good account the great quantities of blood and tankage which had previously been turned into the river. John Bushard, the mechanical superintendent of Armour and Company for many years, was an aggressive exponent of the new methods. He invented several successive processes for the drying of this blood and tankage, and it was thereafter prepared and shipped east and south to be used in the manufacture of fertilizer. The genius of John Bushard was also responsible for the

invention of a number of other appliances and methods, among them a type of ice machine of which several are still in use in Chicago plants.

In 1879 one of the packers put canned meats on the market, and in 1880 butterine, both the result of scientific investigation and experimentation with perishable products. This work in turn was made possible by refrigeration. In 1882 a demand from Europe and the eastern states of the United States began to develop for the shin and thigh bones of cattle, to be used in the manufacture of knife and brush handles and buttons. No use had yet been found for the hoofs and horns.

The Glue Business

By 1884 the adaptability of scientific methods to the utilization of packinghouse by-products had become so thoroughly recognized by P. D. Armour and his associates that he was prevailed upon to take over, as an investment, the glue works at 31st and Benson Streets, Chicago, which had been started by Wahl Brothers fifteen years before. This inconspicuous enterprise had been going on quietly from year to year, applying the searchlight of science to one difficult problem after another until those in charge of it had developed a business of considerable importance.

Wahl Brothers up to this time had been buying their materials at practically "give-away" prices from the packers, who were eager to dispose of their by-products at any price which relieved them of the necessity of burying or shipping them away. The capacity of the business was thus recognized as a commercial success and was placed upon a firm financial footing, rapidly outdistancing itself, not only developing a capacity for the utilization of more raw material than there was in sight, but also a market demand for more of the finished products than it was able to supply. Today the Armour Glue Works receives its raw materials from all over the world and utilizes them under the guidance of expert chemists in the

manufacture of high-grade gelatins, glues, sand paper, and other staples of similar kind.

Prior to the time that chemists were made a part of the regular packinghouse operating force, the packers disposed of some of their by-products in a crude unfinished state to such concerns as Wahl Brothers, already mentioned, which employed chemists. Pressed, undried tankage and blood, glue in jelly form, and evaporated tank water, commonly termed "stick," are examples. Steam-rendered lard was another. This in the early days was frequently discolored, but in 1879 and 1880 was first improved by a chemist, W. B. Allbright, before he became identified with a packinghouse. The improvements were generally the result of the combined efforts of the chemical, engineering, and operating staffs. As yet, however, there were no regular chemical laboratories or chemists regularly employed as part of the operating force in the big packinghouses of the country. The story of how they came to be employed is an illuminating one.

Story of Oleomargarine

In 1870, under instructions from Napoleon III, Mège-Mouries, a Frenchman, succeeded in producing from foreign fats taken from beef a substitute for butter, but less expensive.³ He named his product oleomargarine, not as is sometimes stated because of its resemblance to pearl, the Latin name of which is "margarita," but because it contained, as he believed, the glycerides of oleic and margaric acids. The name "margaric acid," on the other hand, was derived originally from the Latin, though probably before Mège-Mouries used it.

His process was essentially as follows: He heated finely chopped beef suet with water carbonate of potash and fresh minced sheep's stomach to about 115° F. At this temperature

³ *The National Provisioner* (Sept. 27, 1913), Vol. XLIX, No. 13. "The Manufacture of Oleomargarine," a paper read at the American Meat Packers' Convention in 1913 by J. J. Carey, Vice-President Carey-Vail Butterine Company.

the pepsin from the sheep's stomach dissolved and separated the animal tissue from the oil, which he then removed and cooled slowly, thus causing a portion of the stearin to crystallize. He then separated by pressure the crystallized stearin from the oleo oil, and this oil alone he used for butter making. He churned about 10 pounds of this fat with 4 pounds of milk and 3 pounds of water and a trace of annatto for color. The compound thus obtained when well washed was in appearance, taste, and consistency, like butter, and when worked free of excess moisture was found to keep much longer.

Margarine Growth in America

This process was patented in the United States in 1873 where many improvements were made in it. Subsequently, upward of 50 patents were taken out by inventors, protecting various stages of the manufacture. Some of these covered curious processes and materials, such as saltpeter, boric acid, benzoic acid, slippery elm bark, glycerin, etc., to be sold under such names as butteroid, oleoid, creamine, oroxyline. However, Mège-Mouries in 1873 was not, as is sometimes believed, the first oleomargarine patenter in the United States, for earlier in the same year another chemist, Paraf by name, patented the process and organized a large company in New York City, known as the Oleomargarine Manufacturing Company. Between 1874 and 1878 the manufacture of oleomargarine made little headway, but during the next three years it advanced with great rapidity.

Under the Mège-Mouries patent alone, 15 large factories were established prior to the spring of 1881 in the cities of New York, Boston, Philadelphia, Baltimore, Pittsburgh, Cincinnati, Chicago, Buffalo, Cleveland, Albany, Louisville, Detroit, Omaha, St. Louis, and San Francisco. In 1895 there were five factories in Illinois, two in Indiana, three in Kansas City, one in Nebraska, one in Ohio, one in Pennsylvania, and four in Rhode Island. In 1883, 4,000,000 pounds of oleo were

sold in the United States; in 1893, 67,000,000 pounds; and in 1894, nearly 70,000,000 pounds; in 1902, 126,000,000; in 1914, 143,900,000 pounds; and in 1920, 370,730,000 pounds.

This enormous growth in the United States, however, did not compare with the growth in Europe. There the congestion of population and the poverty of the laboring classes made the growth much more rapid, and in 1912 a single factory in Rotterdam produced as much oleomargarine as the entire United States, according to an investigator for the *Scientific American*. Though the United States does not rank high in the oleomargarine trade of the world, it may claim some prominence as a manufacturer of the animal oils that go into the product, for large quantities of these oils are shipped abroad yearly by the American packinghouses, largely to Holland.

One of the early manufacturers of oleomargarine in the United States was Patrick Carey, who with J. J. Murray started to make oleomargarine 40 years ago. Their apparatus was necessarily crude and the process was tedious. Their vat consisted of a small tub surrounded by warm water in a larger tub, while the product was mixed by hand with a large wooden paddle. The process took five hours, and to make a salable or edible article they used a mixture containing 40 per cent of pure creamery butter. From such a primitive beginning the manufacture has grown very rapidly, with improved machinery and more refined stock and materials. The process as used today has been put on a strictly scientific basis and the progressive manufacturer makes a study of the production and quality of all the ingredients.

Patent Controversy and Chemists

This early history of oleomargarine and its influence on the development of packinghouse by-products is of fundamental significance. For the first time a chemist was employed in a consulting capacity in the meat packing industry, when Pro-

fessor Haynes was called upon to give testimony in a suit brought against one of the Chicago companies by the owners of the Mège-Mouries patents for the making of oleo oil. Dr. D'LaFontaine was employed in 1884 as a consulting chemist by Armour and Company to prove that cottonseed oil was present in oleo and that it could not be accepted as lard. Another consulting chemist was Dr. Rose, who did some work for Fowler and Company. Dr. Van Ruymbeke investigated the utilization of the waste tank liquors in connection with one of the packinghouses.

As a result of this suit Nelson Morris, the Chicago packer, was impressed with the great possibilities of adding chemists to his staff and in 1886 he employed the first chemist in a full-time capacity. He felt quite rightly that many problems confronting the industry at that time might be solved by scientific investigators. This pioneer full-time chemist was Herman B. Schmidt, who with his colleagues succeeded in the decade from 1886 to 1896 in solving the fundamental problems of chemical control in the industry and in laying down standards to be followed. Most of these leading pioneer chemists are living at the present time (1923) and have given very cordially much of the information forming the basis of this chapter.

In 1887 one of the other leading packers engaged Dr. Manwaring as their chemist to develop the recovery of pharmaceutical products, particularly pepsin, and in 1889, Dr. O. T. Joslin was engaged as the first chemist of another packer. Dr. J. P. Grabfield and Dr. A. G. Manns were also active pioneer chemists. E. K. Nelson became identified with the industry a little later on, as did likewise W. B. Allbright, now head of the Allbright-Nell Company of Chicago. It has been principally under the direction of these men, together with Dr. W. D. Richardson and Dr. Paul Rudnick and the chemists actively connected with the industry today, that other contributions of the chemists to this industry have been made.

Chemists' Early Troubles

For sometime after starting his new work Mr. Schmidt had many trials, for the rest of the staff looked upon his department as a luxury. In order to prove that it was worth while and could justify its expense, he shrewdly introduced a vacuum pan for the making of extract of beef, which put his department, at that time housed in a room 10 x 10 feet, on a dollar-and-cent basis. In this way various and numerous sources of this product were investigated very carefully. The curing of meats was studied and means were discovered to prevent the souring of the liquors in which the material was cured.

The installation of vacuum evaporators, first single effect, and later multiple effect, stimulated the recovery of boiled beef liquors. These evaporated liquors were at first further concentrated into paste of "solid" beef extract by drying on cast iron steam-heated revolving roll evaporators, and it was not until some years later that they were supplanted by vacuum kettles with agitators. It is rather interesting to note that practically since the days of Liebig the development of the extract of meat manufacture has been under the direction of chemists.

A Routine Developed

With the regular employment of a chemist it became necessary to develop a routine of work. Some lines already offered such a routine. For example, the Pennsylvania Railroad Company used on its lines in 1886 steam cylinder lubricants, for which as an ingredient they purchased a certain high-class tallow. It was specified by the railroad company that this tallow should test not over $1\frac{1}{2}$ per cent of free fatty acid. The development of this idea, to make as much tallow available for this purpose as was possible, led to control of the free fatty acid test of the various products that were made, and the study of the conditions under which free acid was pro-

duced. This investigation resulted in eliminating those conditions that contributed to the production of free fatty acids and so made the tallow product more valuable.

The recovery of tank water containing dissolved nitrogenous constituents, resulting from the cooking of various kinds of packinghouse offal, marked an important step forward from a sanitary as well as from an economic viewpoint. A concern in Hammond, Indiana, employing as chemist Dr. Van Ruymbeke, is said to have been the first to develop the evaporation of tank water which was evaporated to a jelly form in a double effect evaporation. This work was done under the supervision of Dr. Van Ruymbeke, who was the first to do this work in the Chicago Stock Yards. The material was then shipped to Hammond and mixed with copperas and dried in pans. This latter treatment with sulphate of iron was patented by Jobbins and Van Ruymbeke. Later, O. T. Joslin, a chemist for one of the packers, substituted a process of his own wherein the evaporated tank water was coagulated with a ferric sulphate solution and dried on the roll invented by him. This roll system was devised in 1892-1893.

Tallow Refining

The refining of tallows was started in 1886 and the pressing of tallows into tallow oil and stearin and the refining of the tallow oil into acidless grade was started possibly a year later, in 1887. The refining of tallow and oils by means of the fuller's earth treatment was then coming into vogue in the Stock Yards and in the next year or two it became universal. Somewhat later naphtha extraction of tankage and bone was experimented with. This at first met with obstacles in the way of insurance restrictions, but was later developed to its present status. Its general adoption was somewhat slow because of the low grade of grease recovered and the fact that there was only one concern in this country at that time capable of refining this product.

Compound Lard

In 1879-1880, W. B. Allbright first applied chemical treatment in this country to prime steam lard to improve its color. This treatment consisted in the use of caustic soda. To quote Mr. Allbright: "This made so much soap, that in studying for a more economical method I hit upon fuller's earth." This is the first record of employing fuller's earth for this purpose, and it led to investigations the result of which was the present compound lard industry.

This industry, which produces yearly many million dollars' worth of the product and in which millions are invested and thousands of persons employed, has developed practically within the last 40 years.⁴ It had its beginning in what was once known as "lard refining," which originally consisted in purchasing hog lard from various sources, washing it in kettles with pearl ash or other alkalies and salt to settle it, then cooling and filling into packages. By this means the refiner was able to turn out a uniform product which gave good satisfaction to the trade.

The original standard of lard was pure leaf lard, rendered from the leaf fat of the animal. Only a limited amount of such lard could be made, and consequently the lard refiner purchased from all sources lard made from trimmings, head fat, and other portions, which produced a lard much softer than that of the leaf. In order to give the lard the proper consistency the plan was devised of chilling it in properly arranged cellars and submitting it to pressure. This produced a lard oil and left behind a firm lard product known as "lard stearin," which was considerably harder than leaf lard. This was mixed with the refined lard in the right proportions to make products which would be as hard as leaf lard, or even harder so as to suit the different markets for which the lard was intended.

⁴ Wesson, Dr. David, "History of Lard Substitutes," in *The National Provisioner* (Jan. 28, 1911), Vol. XLIV, No. 4; reprinted from Bulletin 13 of Bureau of Publicity of the Interstate Cottonseed Crushers' Association.

Cottonseed Oil and Lard

About 1880 it was discovered that cottonseed oil by proper treatment with various chemicals could be bleached fairly white. It did not have a very good flavor, but this did not deter the lard refiners from working a little of it into their product. The oleomargarine industry, springing into prominence about this time, furnished also stearin, which refiners used to harden up, or offset the softness of the oil in their mixtures. The process of mixing was comparatively simple, while that of cooling consisted in passing the melted fat into upright jacketed cylinders, which had either cold water or brine from an ice machine passing through the jackets. The lard was agitated in these "agitators," as they were called, until it was cold and of the proper consistency to run into the packages.

It was about this time that Allbright, as has been noted, discovered that oil could be bleached by means of fuller's earth. This furnished a very superior bleach to that made by treating the yellow oil with acid, and refiners were used to work in as much as 40 per cent oil with 10 per cent oleo stearin, the balance being hog lard. The fuller's earth gave the oil a bad flavor and the skilful manufacturer depended upon the flavor of the hog lard to cover it up.

Cotton Oil and Prime Steam Lard

In this country the first literature on the subject was published in 1883 when McGeogh, Everingham and Company brought suit against Fowler Brothers of Chicago, claiming that a contract for prime steam lard delivered by the latter was adulterated with cottonseed oil and tallow.

The final verdict seemed to be a case of "not guilty—but don't do it again." At this time the so-called mixtures were sold under the name of "refined lard" or "refined family lard," to distinguish them from the prime steam lard—the contract lard of commerce, but in 1886 a bill was passed in the Massachusetts legislature, compelling all such mixtures to be branded

"lard compound." In 1888 when bills were introduced into both houses of Congress for the purpose of placing a tax on lard compounds in the same manner as the tax that had been imposed on oleomargarine shortly before, it was stated that the total amount of lard produced annually was 600,000,000 pounds, about one-half being pure lard. One-half of this amount was exported, of which about 40 per cent was compound. Up to this time more or less hog lard was used in all compounds.

About 1891 the industry received a great impetus by the application of what was then known as the "Eckstein" process of refining the oil, which made a much more neutral oil than before, with the result that the hogless lard and various substitutes produced today from cottonseed oil are giving better satisfaction than the hog product.⁵

Commercial Fertilizers

Another of the family of packinghouse industries of great proportions is that of commercial fertilizers which was started in the late eighties. In 1868 the waste water which had, up to that time, been turned into the sewers and allowed to escape to the sea without being subjected to challenge, was, to use

⁵ Departments in a modern lard refinery:

1. Oil Storage. Storage tanks for the oil which is received from the refinery either by pipe lines or tank cars, or barrels, as the case may be. The storage tanks vary in size with the refinery and the size of business contemplated, 500 to 5,000 barrels capacity common. These tanks are generally placed in the open and are, of course, closely covered to prevent access of dust and air. Great care to see that tanks and cars are clean should be taken.

2. Oleo Stearin Storage. This should consist of a large, dry, cool, well-ventilated room. The careful manufacturer selects only stearin which is found on test to be sweet and pure and of the proper hardness to suit his purpose. This stearin is a by-product of the manufacture of oleo oil and varies in quality, etc., to fat used. It comes from the packers usually in barrels similar to those for shipping sugar.

3. Melting and Mixing Plant. Here the oleo stearin is emptied into suitable tanks provided with large heating coils, where it is melted up and pumped through a filter press, from whence it runs into tanks where it is mixed in the proper proportions with refined oil.

4. Cooling Department. This consists of large rolls on cylinders, similar to those previously described. The thin film of compound in contact with the roll is chilled almost instantly, and as the roll revolves the film is kept in contact long enough to remove all heat before the frozen compound is removed automatically by a knife pressing on the side of the roll. The lumps of frozen material drop into a trough, where they are broken up by means of blades on a revolving shaft. The semiliquid lard passes from the rolls into the packages, where it hardens up or sets in the course of a few minutes, very much after the manner of a mixture of plaster of paris and water.

The product of the modern refinery is white and sweet, excellent in appearance, flavor and odor, and, according to judges, better than the best products made from the hog.

Mr. C. H. MacDowell's phrase, "held up and convicted of pilfering tendencies." As a result of this discovery a process was developed for the evaporation of all waste waters and extraction of the ammonia and solids which they contained. The solids which remained after this process of evaporation were turned to good account, and made to serve as one of the important ingredients of commercial fertilizer.

Fertilizers were added in 1893 to the list of packinghouse by-products as a result of certain observations and conclusions arrived at in the fertilizer booth of the World's Fair in Chicago by C. H. MacDowell, president of the Armour Fertilizer Works. MacDowell had been assigned by P. D. Armour to represent the house there. The foreign and domestic exhibits of potashes and other fertilizer materials, especially those of the German Potash Syndicate, made an appeal to him. He saw the possibilities of the fertilizer industry in the United States and how tankage, blood, and bones could be expanded into a large independent industry. As a result Mr. Armour was persuaded that an opportunity was being neglected.

Until after the World's Fair the packers had continued to sell all dried blood and tankage, instead of making any attempt to utilize it themselves. In the spring of the following year MacDowell, in collaboration with George Hunt, who had been handling the sale of blood and tankage, set about actively to start a small fertilizer factory and turn out some commercial fertilizer which few people were able to differentiate in their minds from common old-fashioned manure.

Southern Phosphate Experiments

Phosphoric acid had been obtained almost solely from bones. Phosphate rock had been discovered in Tennessee in 1893, and the other deposits were in the Carolinas and Florida. Some of this was brought to the Armour plant, where it was ground up in crude bone mills and acidulated in sulphuric acid, purchased from the zinc smelters. The mixing was done with

common hoes in mortar boxes out in the yards, so that fumes might escape freely into the air and blow away.

This method was not satisfactory as the mixture was wet and sticky and not at all suitable for mixing with other ingredients. There was no literature on the subject and the people who knew how to make acid phosphate kept the secret to themselves. One day a severe rainstorm came up while a vat of 60 degree sulphuric acid was out in the open. It rained hard for two hours, and when the foreman and workmen returned to their mixing of acid phosphate, they discovered the vat of acid apparently steaming. To their surprise the acid phosphate then mixed in the regular way with this sulphuric acid foamed up and produced an excellent article of a satisfactory mechanical condition. Dr. Manns, the chemist, at once saw that a weaker hot acid was necessary to produce the desired reaction and from that time on no trouble was found in making acid phosphate.

Since that simple beginning one plant after another for the manufacture of Armour's fertilizers has been built at favorable points in various sections of the East and South until today these number more than 30. The fertilizer end of the packing industry has perhaps made greater use of the chemist than other lines.⁶

In 1895 the manufacture of curled hair was begun at the Armour Glue Works, in which were utilized not only cattle switches derived from their own slaughtering, but also large quantities of horse tails from South America. One of the by-products which developed about this time had as its sponsor a great public fad. The Safety bicycle, which was invented in 1888 and made tremendously popular almost immediately by the application of "clumsy" or pneumatic tires, created a huge demand on the part of the manufacturers for granulated bone, which they began in 1895 to use as a newer and cheaper

⁶ MacDowell, Charles H., "The Trail of the Chemist in the Packing and Allied Industries," *Chemical Age*, June, 1921, p. 217.

means for "case hardening" in the manufacture of ball-bearing cones. This trade was catered to, of course, and then its decline was superseded by that of the automobile industry which followed. This product is also extensively used by the United States government for putting the blue color on steel rifle barrels and for other ordnance.

Soap

The Armour soap works was organized in 1896. P. D. Armour had determined to go into the soap business and consulted among others C. H. MacDowell, whose other experiment at utilizing by-products was by this time proving, through its profitableness, his sound judgment. MacDowell was asked to take charge of the development of a soap business. It was decided that the manufacture of laundry soap alone should be undertaken at the start and that Armour Glue Works should be the proper place at which to inaugurate the enterprise. A small plant was accordingly built at that place and the distribution and sale of Armour's Family Soap was undertaken through the branch house system. Glycerin was one of the early developments of the manufacture of laundry soap, after which the growth of this branch of the business was very rapid until it came to include a very extensive manufacture of toilet soaps, as well as refined glycerin soap powders and "Lighthouse" cleanser. Swift and Company also have developed a large soap business at the same time as Armour.

Pharmaceuticals

There is another series of by-products which have been of great benefit to the community. In 1885 the corps of scientists and other expert investigators which had been gradually growing in numbers and in resourcefulness, resolved to open a pharmaceutical laboratory for the manufacture of pepsin and pancreatin. This pharmaceutical branch of the business was undertaken and at first conducted by men like Robert

Wilson. At present, for the medical profession only, 48 pharmaceutical preparations are made, glands and membranes being utilized, while fresh, in the plant laboratories. Among the most important medical agents produced in the packinghouse laboratories are pepsin, pancreatin, thyroids, rennet, benzoinated lard, suprarenals, and pituitary liquids.⁷

A Packinghouse Laboratory

To get a clear picture of just what chemical control means, and how it works, it is worth while to consider the chemical laboratories of one of the larger packers, that of Swift and Company, where all food questions, such as sanitation, nutrition, and new food products are dealt with.

The central laboratory of the chemical department of Swift and Company is at the top of the lard refinery in the Union Stock Yards, Chicago. First there are several administrative rooms from which the work of the Chicago laboratory and its many branches is directed.⁸ Here is a very complete chemical library. The work of the Chicago laboratory can be summarized in this way: First, it analyzes all samples requiring chemical analysis. Second, it makes special investigations

⁷ These are made from glands and membranes of hogs, cows, and sheep; among them are some of the most important therapeutic agents.

Pepsin is from the lining of a pig's stomach; it is used as an aid to digestion, and in stomach troubles generally. The most popular forms are pure pepsin, essence, and tablets.

Pancreatin comes from the hog's belly sweetbread. It is employed as a medicine and to peptonize food for infants and invalids.

Thyroid glands of sheep are made into powder and tablets. Thyroids are a specific medicine, and are used in diseases that are due to a deficiency of thyroid secretion. A great many cases of abnormality in children can be cured by thyroids.

Suprarenal preparations, made from the glands that are located just above the kidneys, are used internally, and from the substance is got a powerful astringent and heart stimulant called suprarenalin, which is worth more than \$5,000 per pound. It requires the glands of 135,000 sheep to make 1 pound of suprarenalin.

Pituitary products, from a gland located at the base of the brain, are of great service to the medical profession. The finest of the pituitary preparations is pituitary liquid, a solution of the active principle.

Rennet, the curdling ferment from the calf's stomach, is used in pharmacy, but its greatest field is in making cheese. All cheese factories require rennet in large quantities.

⁸ The main branch laboratories are at Kansas City, South Omaha, South St. Joseph, East St. Louis, Fort Worth, North Portland, and Kearney, Nebraska. The fertilizing factories are at West Hammond, Illinois, Cleveland, Ohio, Baltimore, Maryland, Wilmington, North Carolina, Atlanta, Georgia, Harvey, Louisiana, and Barton, Florida. The laboratories in soap factories and oil refineries are at Cambridge, Massachusetts, Atlanta and Augusta, Georgia, and Houston, Texas. Test rooms are maintained at Memphis, Tennessee, Charlotte, North Carolina, Chicago, Kansas City, Kansas, Toronto, Canada, Ft. Worth, Texas, South Omaha, Nebraska. The department also carries on inspection tests at 35 creameries.



Figure 23. Pharmaceutical By-Products

and researches with a view to developing further the uses of main products and by-products, determining the value of processes suggested from one source or another, and discovering new processes. Third, it conducts dietary experiments to determine the value of oleomargarine and, in general, all packinghouse products. Besides these main functions the chemical department also handles the chemical and microscopic work for the plant doctor's office. It trains all chemists for Swift and Company's 16 other laboratories. It acts in a consulting capacity for operating sales and administrative departments. It follows the patent literature, keeping on file copies of all patents relating to the packing business.

Analytical and Testing Department

To consider the departments of the laboratory individually, the first is the analytical and testing department. The fertilizer section handles the analysis of all fertilizer raw materials and finished products, such as phosphate rock, sulphuric acid, acid phosphate, blood, tankage, bone, cottonseed meal, nitrate of soda, sulphate of ammonia, and so forth. Moreover, samples are analyzed of all fertilizers in various stages of manufacture, and of the final mixed product before shipment. In addition to this, different mixtures are tested out for what is called their "mechanical" condition; that is, whether or not they will cake in piles or sacks.

The samples come to the fertilizer sample room, where they are ground and then delivered to the head chemist of the fertilizer section of the laboratory. He assigns the work among his various assistants, who, by means of the complete laboratory equipment, make the necessary tests and analyses. They make their reports, and these reports are checked in the proper quarters. All this is very necessary work, for fertilizers are put out under a guarantee, and the chemical department has the responsibility of seeing that the guarantee is backed up absolutely by the product.

In another section all oils and fats, edible and inedible, are tested regularly. This work includes analyses of lard, tallow, grease, cottonseed oil, soya bean oil, cocoanut oil, peanut oil, lard compound, oleomargarine, and so forth—the raw materials, the products at various stages of manufacture, and the finished product.

The next section is that dealing with soap and soap products, and glycerin. Here the raw materials of soap manufacture, such as oils, fats, and greases, caustic soda, soda, ash, borax, and other substances are analyzed. Soap is tested at all stages of manufacture, also when finished and ready for shipment. Glycerin, which is the principal by-product of soap manufacture, is also analyzed during the course of purification, as well as when ready for shipment in the form of dynamite, or chemically pure glycerin.

The fourth section is devoted to the various processes of curing meats. This is very important work, for the quality of hams and bacon depends upon the accuracy and thoroughness with which certain analytical tests are carried on in the chemical laboratories. These tests and their results are secret, but this much can be said—the chemists supervise the admixture of preparations that are used in curing meats; this insures their uniform and standard quality. Indeed, this department analyzes all curing materials, such as salt, saltpeter and sugar, and all cured meats as well, namely, ham, bacon, salt pork, cured beef, and dried beef. The materials are analyzed before, during, and after the process of cure in order to determine that the curing process is operating uniformly and to insure a uniform high quality in the finished product.

Test All Supplies

The fifth section handles all engineering supplies, testing every substance used by the construction department in any way. The cement that goes into the floors, the paint for the woodwork, the steel for the girders, the solder for plumbing—

samples of every material are tested in the chemical laboratory. Engineering supplies, such as water, coal and fuel oil, lubricating oils, paints and varnishes, iron and steel, babbitts, and bronzes, cement and plaster, and, in general, all supplies entering into the construction operations, are regularly analyzed.

The sixth and final section is devoted to glue testing. All glue raw materials and the finished products are regularly tested for composition and strength, or technically for viscosity, jelly strength, foam, fat, and keeping properties.

Research

There is no separately organized research laboratory as yet, but researches have been carried on diligently for twenty years. For example, the entire cold storage problem was investigated when the government was criticizing cold storage methods; researches were carried on regarding the effects of saltpeter and sugar in the cure of meats, the corrodibility of various irons and steels, the hydrogenation of oils and fats, the development of American sources of potash, and many others. For this research eight separate rooms are set apart.

Dietary Experiments

The next department is that which conducts dietary experiments. As a part of a great food manufacturing organization the chemical department finds it necessary to conduct extensive investigation in the field of dietetics. For example, since the war, dietary experiments have been in progress to demonstrate the comparative values in the diet of oleomargarine, meat, and meat products, including various fancy meats, canned meats, and vegetables. The laboratory has had as many as 1,200 white rats on its feeding schedule at one time, though the number varies from week to week. They are watched carefully and weighed regularly, and the various figures are gathered together into statistics that furnish the results of the investigations.

Bacteriological Department

The next section is the bacteriological and biological department of the laboratory. The plant doctor, in keeping the employees in fit physical condition, finds it necessary to have various bacteriological and chemical tests made, and this part of the laboratory does it for him. Other work of an important nature is carried on here, for it is this department which co-operates with the Biochemic Division of the Bureau of Animal Industry of the United States Department of Agriculture. The Biochemic Division has itself been of great assistance in the solving of chemical problems of the meat industry, the results of which research are published from time to time. As an instance of this co-operation sometime ago, this department in co-operation with the Bureau of Animal Industry, conducted an extensive investigation of trichinae. The results obtained were in full accord with those secured by the government, and the co-operation was beneficial to both parties. As a result definite regulations were established, determining the amount of cure and smoke necessary for pork products, and the protection of the public was carried one considerable step further.

Thus in one organization there are now the analytical chemist, the research chemist, the chemical engineer, and the business or commercial chemist.

Summary of Chemists' Work

The work of these present-day chemists, chemical engineers, or technologists in this industry in addition to analytical work for control of product and supplies may be summed up thus :

1. Waste prevention.
2. Improvement of methods and processes of operation.
3. Utilization or recovery of products in a more valuable form.
4. Initiation of new processes.

5. Direction of industrial research and application of the researches until placed on a commercial basis.
6. Investigation and putting on a commercial basis new industries and lines of activity allied and associated with the packing industry.

The chemists and their development of chemical control taught the packers of the United States how to handle their products. They made it possible to distribute their products over the world. In the phrase of Thomas E. Wilson, in an address before the American Chemical Society, Chicago, September 7, 1920: "They started in with refrigeration, with control of the curing processes, with control of the canning and have made it possible for this business to become one of the largest industries in the world."

Control of Quality

For chemical control made possible an organized control of the quality of products throughout the entire packing industry. Beginning with chemical control in the laboratory of the chemist, quality control was gradually extended from the purchase of livestock at one end to the finished product at the other end in the form of ham, bacon, sausage, lard, canned meats, choice beef, mutton and pork cuts, butterine, glandular extracts for medicinal use, surgical sutures, strings for musical instruments, glue, animal and poultry feeds, and fertilizer, the quality of all of which must be satisfactory to the buyer.

In one great packing company this matter of quality control has been worked out in this way:

The details incident to these operations have required the development of the following quality control divisions, which serve not only as individual checks on quality, but as a check on one another and a combined co-operative control force in the interest of our company not only producing satisfactory quality in both edible, and inedible products, but, equally important, maintaining this quality on a uniform basis:

1. Control through purchasing units
2. Practical or operating department control
3. Scientific and technical control through a system of modern laboratories
4. Engineering control
5. Control through field sales forces
6. Co-operative sales and operating control.⁹

The quality of livestock bought by the packer is maintained by a well-organized group of buyers who have had years of experience in judging quality of livestock and meat. Quality control is applied to all other raw materials used by this packing company and is secured at each plant by the local purchasing department working under a general purchasing agent. This is one of the most important features in maintaining standard of product which is so vital to millions of consumers.

The method of insuring this is described by Mr. Wilson in these words:

Our system provides that, regardless of the size and nature of a consignment of raw material, the receiving department must not receive it until after the approval of all control divisions interested is a matter of record in the receiving department. This may mean that a product must be held over after chemical analysis has been made, or, on the other hand, practical demonstrations of its merits in an operating way. In any event, each control division interested must carefully inspect the product and subject it to all tests and analyses necessary accurately to determine that it measures up to the standard set by Wilson and Company.

The operating division is the most important unit of control, as it starts with the raw material, whether it be livestock, cottonseed oil, or spices, and carries them through the many processes until they become finished products ready for the trade. This division is the custodian of millions of pounds of meat that are either in a fresh state or in the process of manufacture. It will be seen at a glance that there is no small responsibility resting upon those who are not only required to preserve the wholesome quality of these products, but further maintain the standard of uniformity in quality. This division is also charged with the

⁹ Wilson, Thomas E., "Quality Products," *Management Engineering* (February 1923), Vol. IV, No. 2, p. 114. The following discussion of quality control is largely based on this article.

responsibility of packing and shipping the products. The work must be well done, as service through prompt deliveries has a vital bearing on quality of perishable products.⁹

The practical or operating department control is supervised by heads of divisions who have had wide experience and are well trained in checking details. For attention to minute details is the secret of insuring proper control of the quality of the product, and this care has resulted in methods which insure correct standards being made a matter of company record. Written instructions embodying them have been prepared so that the same quality can be reached in any plant of the company.

This remarkable achievement in control of quality is due to organization of all divisions of this company's operating force and that of many others, to secure quality, and it is due also to a spirit of co-operation in rigid adherence to standards, which is one of the admirable illustrations of the fact that the packing industry is a leader among progressive American businesses.

Packinghouse By-Products

The principal by-products, with their source and uses, are:¹⁰

BONES	<ul style="list-style-type: none"> Knuckles Skulls Jaws Blades Forearms Buttocks Hips 	Grinding stock	Inedible tallow	<ul style="list-style-type: none"> Soap Lubricating oil Candles Stearic acid Cosmetics Polishing compound Liquid fire Glycerin <ul style="list-style-type: none"> Medicine Explosive
				<ul style="list-style-type: none"> Furniture making Book binding Straw hat sizing Standard emery paper Building Ornaments
			Glue	<ul style="list-style-type: none"> Fertilizer Case hardening bone Sugar refining (bone charcoal used as filter)
	<ul style="list-style-type: none"> Sirloin Strip loin Knuckle Rump 	<ul style="list-style-type: none"> Edible tallow—lard substitute Glue—as described previously Bone meal—as described previously 	Manufacturing stock	<ul style="list-style-type: none"> Tallow Glue Buttons and combs Knife handles Pipe stems Tooth brush handles Powder puff tips Crochet needles
	<ul style="list-style-type: none"> Shin Thigh 			

⁹ *Ibid.*, pp. 114-15.

¹⁰ This table was prepared by Mr. G. L. Noble, formerly a member of Armour's Bureau of Agricultural Research and Economics.

HORNS	{ Combs	
	{ Hair pins	
	{ Barrettes	
	{ Buttons	
	{ Ornaments	
HOOPS	{ Umbrella and cane handles	
	{ Knife handles	
	{ Fertilizer	
	{ Outer shell	{ Buttons
		{ Hair pins and barrettes
		{ Fertilizer
HIDES AND SKINS	{ Inner portion	{ Neatsfoot oil—harness, shoe, and special lubricants.
		{ Stearin—soaps, candles, etc
		{ Glue
		{ Fertilizer
		{ Shoes
BRISTLES AND HAIR	{ All leather goods	
	{ Lacing	
	{ Harness	
	{ Whips	
	{ Beltings	
WOOL (All woolen goods)	{ Bags	
	{ Suit cases	
	{ Drum heads	
	{ Plaster retarder	
	{ Artists' brushes	
FATS	{ Curled hair for upholstering furniture and auto cushions	
	{ Paint brushes	
	{ Scrub brushes	
	{ Sausage containers	
	{ Lard containers	
GLANDS—48 preparations used by the medical fraternity to treat various diseases, such as rickets, goiter, mental backwardness, influenza, also in obstetrics, surgery, menopause, etc.	{ Snuff containers	
	{ Gold beaters' skins	
	{ Fancy bottle caps	
	{ Drum snares	
	{ Tennis strings	
MEAT SCRAP AND BLOOD	{ Ukelele strings	
	{ Harp strings	
	{ Violin strings	
	{ Other kinds of musical strings	
	{ Surgical ligatures	
GLANDS—48 preparations used by the medical fraternity to treat various diseases, such as rickets, goiter, mental backwardness, influenza, also in obstetrics, surgery, menopause, etc.	{ Ox gall	{ Setting dyes, used in paints, dyes, laundries, and dry cleaners
		{ Activates bile secretion
		{ Gall stones for ornaments
		{ Oleomargarine
		{ Soaps
GLANDS—48 preparations used by the medical fraternity to treat various diseases, such as rickets, goiter, mental backwardness, influenza, also in obstetrics, surgery, menopause, etc.	{ Glycerin	{ Medicinal purposes
		{ Liquid fire
		{ Cosmetics
		{ Polishing compounds
		{ Explosives
GLANDS—48 preparations used by the medical fraternity to treat various diseases, such as rickets, goiter, mental backwardness, influenza, also in obstetrics, surgery, menopause, etc.	{ Stearic acid	
	{ Red oil lubricants	
	{ Ointments	
	{ Special oil for leather dressing	
	{ Torpedo lubricating oils	
GLANDS—48 preparations used by the medical fraternity to treat various diseases, such as rickets, goiter, mental backwardness, influenza, also in obstetrics, surgery, menopause, etc.	{ Heavy lubricating oils	
	{ Illuminating oil	
GLANDS—48 preparations used by the medical fraternity to treat various diseases, such as rickets, goiter, mental backwardness, influenza, also in obstetrics, surgery, menopause, etc.	{ Meat meal—stock feed	
	{ Blood meal—stock and poultry feed	
	{ Tankage—fertilizer	
	{ Pituitary—base of brain	
	{ Pineal—surface of brain	
GLANDS—48 preparations used by the medical fraternity to treat various diseases, such as rickets, goiter, mental backwardness, influenza, also in obstetrics, surgery, menopause, etc.	{ Thymus—neck	
	{ Pepsin—stomach	
	{ Spleen—spleen	
	{ Thyroid—neck	
	{ Uretic—abdomen	
GLANDS—48 preparations used by the medical fraternity to treat various diseases, such as rickets, goiter, mental backwardness, influenza, also in obstetrics, surgery, menopause, etc.	{ Suprarenalin—kidney	
	{ Ovaries	
	{ Corpus luteum—part of ovaries	
	{ Mammary	
	{ Pancreatin—pancreas	
GLANDS—48 preparations used by the medical fraternity to treat various diseases, such as rickets, goiter, mental backwardness, influenza, also in obstetrics, surgery, menopause, etc.	{ Parotid—neck	
	{ Parathyroid—near tongue root	
	{ Kephalin—brain	
	{ Lecithin—brain	
	{ Thromboplastin—brain	
GLANDS—48 preparations used by the medical fraternity to treat various diseases, such as rickets, goiter, mental backwardness, influenza, also in obstetrics, surgery, menopause, etc.	{ Red bone marrow—tonic	

CHAPTER XVII

NATIONAL DISTRIBUTION SYSTEM FOR PACKINGHOUSE PRODUCTS

Early Trading in Provisions

Up to the period of refrigeration practically the entire commerce in meats in the United States was in mess pork and beef, and in lard and tallow. A tremendous volume of business developed, especially after the Civil War, but during this time the pork packers with more than local trade did not find it necessary to build any special distribution system. They confined their efforts to production and left the distribution of meats entirely to speculators and brokers. During the seventies and part of the eighties even the large packers, like Swift and Armour, confined their efforts largely to the assembling and processing of raw materials, trusting to the Board of Trade speculators and local jobbers to take care of the distribution of their pork products. The retail merchant and the consumer were left entirely out of the scheme of things. They might get their supplies regularly, irregularly, or not at all as far as the packer's efforts were concerned.

It was out of this situation that the system of trading for future delivery in provisions began in the sixties. The trading in futures in pork products began during the Civil War when the government wished to buy prime mess pork for later delivery. Before there was trading in futures, pork packing was considered the worst and most risky operation possible, because the packer himself had to carry his products until a cash demand came for them, unless the packers were able to break prices of hogs to a safe figure. Of course this specu-

lative feature sometimes enriched certain packers who were fortunate or shrewd in their guesses, but the system of future trading benefited each packer by enabling him to buy the raw material from day to day as it was sent in at the convenience of the producer and at the current prices without fear of loss, when otherwise he would only be in the market occasionally. With the trading in provisions futures, boards of trade entered into the packinghouse system of distribution, standardized their operations, and put them on a permanent basis. It is, therefore, important to consider this system which is in vogue today.

Board of Trade Functions

The general functions of boards of trade are well known, but it may be well to summarize here the statement of the Industrial Commission appointed by Congress in 1898 to investigate effects of speculation on value of farm products:

1. They localize industrial risks among a commercial class whose special function is to distribute surplus supplies over times and places of deficit in such a way as to lessen the uncertainty of producers and consumers.

2. They relieve producers and consumers from carrying a whole year's stock, enabling the farmer to convert his crop promptly into cash capital, and the latter to supply himself as his periodical needs may require without enhancing prices beyond the original rate of risks and returns of such capital investments.

3. Competition of speculative traders tends more than any other force to reduce profits of these agencies to a minimum per unit of commodity handled. Released from their economic functions it is to their interests to seek to reduce the risks of distribution to a minimum. By expert acquaintance with the conditions that involve risks, the hazardous elements are gradually limited, if not entirely eliminated.

Chicago Board of Trade

Of the boards of trade the Chicago Board of Trade has been the most important as an auxiliary to the meat packer in

the process of distribution, as a "clearing house or digester for the trade," and a barometer of values.

The Chicago Board of Trade is so closely related to the packing industry that, if such relations did not exist, the industry would lose what constitutes, without any argument, one of the most important factors that makes for the success today of practically every packinghouse of any consequence in the United States.¹ For without the basis of values determined by the daily transactions on the Board of Trade, there would be no definite basis on which a packer could figure what his product was worth, and he would be speculating regarding its value instead of knowing absolutely the prices at which he can sell at least 50 per cent of his product.

For example, a packer may have a large demand for certain weights of hams and bacon, but he has to buy heavier hogs to get the smaller ones. The fat heavy stuff has no immediate sale, or it may be that some other packer has a brisk call for fat bellies, or "skin bakes," or some other kind of heavy pork cuts. These are sold on the Board of Trade and a buyer is found instantaneously, or after waiting a short while. There is one big hog plant in the Union Stock Yards, Chicago, which sells almost its entire product on the Board of Trade. One large packer takes nearly all of this company's fat stuff and heavy sides. The surplus of other plants is also passed into the brokerage channel for redistribution to the best advantage. The brokers and the Board of Trade necessarily become valuable adjuncts to the profitable existence of the provision trade in the United States.

Chicago Price a Basis

In 1912 when Mr. E. L. Roy of Chicago was visiting a Canadian plant, the sales manager received a bid by wire for a round lot of refined lard. Glancing at the close of the mar-

¹ "The Relation of the Chicago Board of Trade to the Packing Industry," by E. L. Roy, of Cross, Roy and Saunders, Chicago, Illinois. This was a paper read at the eighth meeting of the American Meat Packers' Association, Chicago, September, 1913.

ket, which had come a few minutes before the bid was received, he dictated a refusal and made a counter-offer, closing his telegram with these words: "Chicago market 15 higher." Down through Washington, California, back east through Colorado, Kansas, Missouri, in fact everywhere, the same basic value is used. There are but few manufacturers in the world provided with a market at the end of a wire every day in the year, where they can sell the product manufactured if the market pleases them, or buy what they may have contracted to deliver if they do not wish to manufacture it. In this particular the Chicago Board of Trade's relation to the packing industry is a most intimate and helpful one.

The Board of Trade frequently acts in the capacity of salesman for the packer. For example, a buyer today can purchase on the Board the main provision products dealt in, such as pork, lard, and ribs, for delivery in October, January, or even May. The product so purchased will be delivered to him as the month arrives. Special mention is made of this fact for the purpose of calling attention to the legitimacy of value of the future contract as made on the Board when a buyer wishes to provide for his requirements several months ahead. But it should be noted that the old-fashioned salt pork has declined in fashion and the demand for it has lessened. Hence there is now (1923) very little actual futures trading in it. However, the Board of Trade price quotation continues to be the basis of its value in the trade.

Daily Barometer of Conditions

Another very important department admirably handled by the Board of Trade which contributes largely to the packers' welfare, is that which furnishes daily reports in connection with the packing industry. Early every morning there are posted the receipts at, and shipments from Chicago of lard, cured meats, fresh meats, etc. This barometer of trade is of the utmost importance, and is generally a fair indication of the

movement of products from other packing centers. The Liverpool market in lard and cut meats is also posted daily, a great help to the manufacturer here and the buyer abroad.

An important function performed for the packer by the Board of Trade, and one which helps place the packing business on a sure foundation, lies in regulations adopted by the Board members, calling for uniformity in quality, weight, cut, trim, average, and package. To insure this uniform standard which its requirements demand, the Board maintains an inspection department in charge of a chief inspector, whose duty it is to furnish certificates of Board of Trade weights and inspection, whenever his services are demanded by seller or buyer of products coming into or going out of Chicago.²

Inspection System

This inspection system, which is separate from the federal meat inspection service, is a very important part of the selling end of the packing business, as the certificate of the Chicago Board of Trade is not only accepted, but frequently demanded, by practically every market in the world using United States meat products. This official inspector is frequently called upon to pass on the regularity of weight, packing, etc., of products traded in and very few are the instances where any dissatisfaction is found with his verdicts. In the event of such dissatisfaction, however, there is further provided by the Board, through the Committee on Provisions Inspection, a special court of appeal, before which all complaints may be brought, arbitrated, and finally disposed of.

A further aid provided for the packer under the direction of the Chicago Board of Trade is the registration of packinghouse products, beef, sheep, or hog products in store in warehouses declared to be "regular," for the storage of such property. The Board sees to it that before any warehouse shall

² See Rules and Regulations of the Board of Trade of the City of Chicago: "Requirements as to the Cutting and Packing of Hog Products."

be declared "regular," a bond with sufficient sureties subject to such conditions as deemed necessary by the board of directors of the Board, is filed in connection with such warehouse.

The Board appoints a competent person as registrar of provisions, whose duty it is to keep records of all warehouse receipts for packinghouse products stored in such regular warehouses. These receipts after being stamped "Registered" are negotiable, and all deliveries of beef, sheep, or hog products in store in the absence of special agreement, shall be by the delivery of registered warehouse receipts, accompanied by certificates of inspection previously referred to. One can see the very great saving in time that such a system affords.

Summary of Products Traded In .

These are the main features of the Chicago Board of Trade relating to the packing industry. It furnishes any packer who will deliver standard produce, a regular market, sees that goods brought to that market are sold at the market price, affords him protection in the event of dispute, gives him daily information that he could not obtain in any other way, except at an enormously increased expense, and places his business in the front rank of commerce.

In addition to the main products quoted on the Chicago Board of Trade, mess pork, lard, and ribs, there are many packinghouse by-products that are dealt in, largely by brokers who also buy and sell the main products. Many of these brokers do a large business, e.g., in blood, digester hog tankage materials, fertilizer tankage materials, bone meals, cracklings, glue and gelatin stocks, hoofs, horns and manufacturing bones, hog hair, pigskin strips, etc. Much of this brokerage business brings in too great a duplication in the distribution of these products, which is needless and uneconomic.

The charge has been made that before modern large-scale distribution systems were built the packers in Chicago gradually became more interested in the Board of Trade, in specu-

lative operations rather than in the production of their business. Indeed, it was stated regarding some of them that they looked on their plants as places where the commodities were prepared to fill their speculative obligations. This was true to some extent. The directors of the International Packing Company, it would seem, did not for years do a legitimate business, but squandered money in puts and calls. It was this very fact, however, which caused its legitimate business of pork packing, for which the company was organized, to go to the wall.³

Several noted corners have taken place in provisions as in grain on the Board of Trade. One of these was the Armour pork corner in 1879.⁴ Among others who indulged in speculation were B. P. Hutchinson, known as "Old Hutch," and later John Cudahy; but this attempt at cornering the market was the exception and a misuse of the institution which often resulted in loss. Due to the wise policy of the board of directors, this feature has been eliminated.

At present the Board of Trade outlet to market is relatively more important to the many hundred small packers than to the larger packers who have developed their own national distribution systems. Yet the larger companies use this agency freely for making purchases as well as for making sales. For example, the deliveries of Armour and Company amounted in 1914 to \$769,328, in 1915 to \$507,142, and in 1916 to \$4,867,363, while their purchases for the same years were \$568,657, \$2,724,160 and \$158,976 respectively. The deliveries of Swift and Company in 1916 amounted to \$1,030,198, and purchases to \$10,070,305.

New Distributing Agencies

When the process of centralization and shipment under refrigeration in the seventies and eighties began to lengthen

³ *The National Provisioner* (Mar. 26, 1904), Vol. XXX, No. 13.

⁴ Lloyd, Henry D., "Making Bread Dear," in *North American Review* (Aug., 1883), Vol. 137, No. CCCXXI; Denslow, Van Buren, "Board of Trade Morality," in same (Sept., 1883), No. CCCXXII; Taylor, *History of the Chicago Board of Trade*, Vol. II, p. 613.

the radius of the market, new agencies were employed to distribute packinghouse products. Indeed, there was an absolute need for some kind of marketing agency for handling fresh meats at the consuming centers. The wholesale grocers, it is true, had for a long period played a conspicuous part in the distribution of cured meats and other products of the packinghouses, but not being fitted for handling fresh meats, they soon lost their trade in the cured product.⁵

The need for a new marketing agency was at first met in some sections by a body of commission merchants and independent wholesalers. But the growing demand in the eighties for the distribution of fresh meats in enormous quantities, the dressed beef trade, having increased very rapidly, did not lend itself to the jobber system of distribution. This accounts for the fact that Swift and Company and Armour and Company, which were developing a nation-wide business, have never found the jobber system practicable for their business. For this reason branch houses and refrigerator cars were quickly and surely developed into great sales organizations.

During the rise of the dressed beef trade in the late seventies and eighties, as already described, G. F. Swift and other packers realized that the successful introduction of dressed beef into the markets of the country would depend largely on having local agents or consignees. Their services were important in introducing the goods and in handling them to the best advantage. The consignee was in a position to overcome the prejudice existing at that time against western dressed beef and his recommendation would go a good deal further than that of the packers' salesman or representative who might come in to deal with the trade directly. So for years in many places, firms and individuals, at first doing a comparatively small business, grew to be large factors in the packing trade and many of them became wealthy on commissions earned from the "consignee" business.⁶

⁵ Federal Trade Commission Report, Pt. IV, Chap. II, p. 33.

⁶ *The National Provisioner* (June 5, 1909), Vol. XL, No. 23.

Origin of Branch Houses

With the great increase in the volume and extent of the packing business and the development of their present sales organizations the methods of selling their products changed. Jobbers would not take anything except the staple provisions, so that in order to sell widely all their products, the bigger packers have found it necessary to have their own branch houses to deal directly with the trade. It was their experience also that this could be done at a lessened expense pro rata, but to some extent the bigger packing companies still use the consignee arrangement. In 1918 Swift and Company, had 17 regular consignees; Armour and Company, 22; and Morris and Company, 7.

The question as to which method, consignee or branch house, is best from the standpoint of producer and buyer is a broad one. There is no doubt that in a small city, or point of shipment a consignee who has his own facilities in the shape of coolers and branch house equipment, who is well thought of by reason of his capital and general business standing, and who also handles other lines of products, such as country produce, fruits, etc., can give the shipper excellent service by reason of prices realized and the guaranteeing of profits. In such a case the result will not only be profitable to the packer, but it will be fully equal to the returns from a direct branch house. If the packer relies in a small place on a branch house he has to depend on hired help entirely, and he is in a locality where the volume of trade, at its best, is bound to be limited and where he has only one line of products to supply the trade. On the other hand, the consignee caters to various lines of trade and so reduces selling expenses proportionately, but in cities of large population, where the volume of trade is practically without limit, and especially where large lines of specialties and fancy brands of goods are in demand, the question of consigning or of selling direct is often a very difficult one for the packer to decide.

Brokers, Consignees, and Branch Houses

The consignee is, of course, a different factor from the broker who acts only as an agent between seller and buyer to close a deal and decide on details of quantity and prices.

Brokers formerly filled most of the orders for larger packers, and many packers still buy through brokers who fill their orders. Brokerage houses, however, are of greater importance to small packers. The branch house from 1890 on was more important for the larger packers than was the broker, and in fact has become the most important part of the marketing organization of the larger packers. There are in the United States some 1,327 of these branches, operated by interstate slaughtering companies. Of these the five larger packers own about 1,000. More than half the branch houses are located in the Atlantic seaboard states and a large proportion of these are in the North Atlantic states.⁷

The branch house is a natural growth of concentration and large-scale production in the packing industry. Just when the first branch house appeared is not certain. A general date which can be taken as a starting point is 1880, for about that time W. H. Noyes, of Swift and Company, was making arrangements with various partners of G. F. Swift throughout the East for developing the business. Swift and Company for a long time preferred such distribution through consignee partners with decentralized control. Armour during these very early years employed but one traveling salesman. This man marketed in a wholesale way all the principal cuts. It was not unusual to sell one wholesale jobber from 30 to 60 carloads of products at one time. This one salesman made a practice of going through the East once a year to solicit the trade.⁸ However, when beginning a little later to establish definite sales outlets, Armour believed in a centralized policy for control of branch houses.

⁷ Federal Trade Commission Report, Pt. IV, Chap. II, p. 32.

⁸ *Armco* (July, 1914), Vol. III, No. 7, article by Everett Wilson.

The first branch house of Armour and Company was established in New York in 1884. Up to that time Armour products in the East had been sold through H. O. Armour and Company. The New York branch house was designed to serve merely as an outlet for canned meats which were being produced in constantly increasing quantities.⁹ It led, however, in a short time to the establishment of other branch houses for the sale of smoked and pickled meats.

Branch House Definition

The first regular branch house, in the present sense of the word, as a place where meats and meat products are sent from a central packing plant for local distribution to the retail trade, where cold storage is provided and, in a few cases, where some of the final processes are carried on, was established in Albany in 1885. There facilities in the shape of smokehouses were provided for smoking hams, and bacons were received in pickled form from the West. All of this local smoking of pickled meats from the West had previously been done by consignees and brokers who did their own smoking. The Albany house was the first real step taken by Armour and Company toward getting away from the jobber of sweet pickled meats, going beyond the former preliminary treating of products, and disposing of them direct to merchants in thoroughly finished form. The second Armour branch house was the result of taking over a brokerage agency in 1886.

By 1888 there were 11 Armour, 9 Morris, and 1 Cudahy houses. The number of Swift houses is not known. Beginning with the next year, the number of these establishments began to increase rapidly, and by 1889 the 5 larger packers had 544 houses, by 1908 the number was 887, and in 1916 it was about 1,000.¹⁰ The branch houses soon required new methods and as early as 1889 systems of branch house accounting were

⁹ "Armour's Distributing System. Outline of Origin and Growth," in *Armour Magazine*, Vol. V, No. 2 (Feb., 1916).

¹⁰ Federal Trade Commission Report, Pt. IV, Chap. II, p. 33.

devised and put into operation, and three years later in Armour and Company a branch house credit system.

The Federal Trade Commission summarizes the branch house organization as follows:¹¹

These branches are something more than selling agencies. They are factories in a way, where, for example, meats are cured and sausage manufactured; they are cold storage plants for holding stocks for limited periods; and so far as goods are withdrawn from them to ship to surrounding territory or for supplying car-route cars, they may not improperly be called warehouses; but primarily they are wholesale markets.

In the case of Swift and Company and Armour and Company there are over 800 branches and over 6,000 salesmen. As regards Armour and Company, in addition to 16 complete packing plants, 59 of the branch houses conduct some slaughtering on their own account as well as manufacture sausage and maintain smokehouses for the smoking of hams and bacon, and cooking of hams under government supervision. One-third of the branch houses maintain mechanical refrigeration plants and another third are equipped with natural ice refrigeration.

Branch House Organization

Each of the branch houses has its own manager, office force, and sales and delivery organization. The branches are grouped into districts—in the case of Armour and Company, some 25 in number—under the supervision of a district manager, or field superintendent. The field superintendents in turn report to the general branch house superintendent's office in Chicago. Each branch house is, therefore, an integral part of the system of distribution.

The meats, especially carcass meats, are often handled by the branch house on a commission basis, the commission ranging from 48 to 65 cents per hundred, but this does not mean that the manager is acting in the capacity of commission merchant. He, like all the other branch house employees, works on

¹¹ Federal Trade Commission Report, Pt. IV, Chap. II, p. 34.

a salary basis, and the commissions merely supply means for paying the expenses of the house. It is desirable from the company's point of view to make the manager feel that the business is his in the sense that he must make it pay. Wilson and Company, Inc., since 1916 has followed the plan of assigning a definite capital for each branch, according to its needs, and charging interest thereon.

The branch house manager is charged, or "pays" prices fixed absolutely by his company for goods of the company's production. He is not at liberty to buy where he will, and is not free to pursue his own selling policy, but is subject to instruction from the district superintendent, the district inspector, and the managers of the various departments from which he draws supplies at the plant. The co-ordination of the different units in their selling organizations and the selling organization with the manufacturing end of the business is made an objective by the packers.¹²

Real Scope of Branch Houses

These houses, however, are something more than branches. They constitute an important part of a great system of production and distribution. To say, therefore, that Swift and Company has 415 branch houses or Armour and Company has 370 such houses and employs in connection with them more than 3,000 salesmen, does not disclose the full scope of the big packers' position in the wholesale market. The manner in which the location of branch houses is decided and the houses are supplied with products to meet every grade of want, the opportunities they furnish for gathering market and trade information, the way in which they are connected by every means of communication with one another through the district superintendent and with the central office by private wires, the mails, the telephone, and by weekly and monthly reports, gives them a selling efficiency more than proportioned to the number

¹² This is the case with Morris and Company.

of outlets they furnish.¹³ The general branch house superintendent is not necessarily a general sales manager. For example, Armour and Company has no general sales manager. The general superintendent of branch houses does not concern himself with specific distribution of the products of any particular department. Something like the functions of a general manager, however, are supposed to be performed by each of the 25 field superintendents in his own territory.

Each department of the business has its own sales manager in the Chicago general office. There are some 25 of these, each corresponding directly with the field superintendents or branch house managers and individual salesmen. Each department promotes among the superintendents, managers, and salesmen of the branch houses the interests of the particular products that come under the jurisdiction of the individual department. In addition to the regular branch house salesmen, each department has its own specialty men whose operations are not confined to any particular branch house. The canned meats department, for example, has 53 specialty men in the whole United States, educating regular salesmen and reinforcing their work. The soap department has some 125 men and these men simply supplement the work of the regular branch house organization.

In addition to the full-fledged branch houses, some of the companies have outlets closely associated with the branches and subsidiary to them. Swift and Company, for example, has a considerable number of "substocks," that is, houses with an organization in all respects like the branch house, except that they have no accounting department. Sales tickets and reports of all kinds are sent to a neighboring branch, through which all accounting to the district office and the Chicago office is done. In 1918 the company had 39 of these substocks, 24 of which were located in the South and Southwest.

¹³ For description of a typical branch house of the Jacob Dold Packing Co., see *The National Provisioner* (Feb. 16, 1908), Vol. XXXVIII, No. 7.

Other Outlets

Still another outlet closely associated with the branch house system is found in the storage and delivery houses. These are merely the establishments of local merchants who enter into contract with the packing company to store goods as shipped and to deliver them to customers secured by the company's salesmen attached to a branch house having jurisdiction of the territory. The storage and delivery service is performed on a percentage basis.¹⁴

Besides the branch house system the packers have access to the markets by all the avenues open to their competitors, such as the hotel supply companies, some of which they own. The hotel and restaurant trade seems to be a part of the food distributor's business that requires special care. It stands midway between the retail and the wholesale trade. In character the hotel is an ultimate consumer and might be expected to buy its supplies from retailers, as other consumers do. From the point of view of volume and economy in delivery it may, and often does, surpass all but the largest retailers and may claim the right to buy at wholesale prices.

Cold Storage Facilities

A factor indispensable to the proper functioning of branch houses, substocks, storage and delivery houses, and hotel supply companies is cold storage. There were some 424,968,313 cubic feet of cold storage space in the United States in August, 1918. Of this the bigger packers had about 25 per cent of the total. They also have a considerable amount of cold storage space largely used for chilling meat in connection with their packing business. The bigger packers' cold storage space is used for storing and holding their finished meat and other products till they are sold.¹⁵ Some of this storage is located at or near their packing plants, but a large part of it is distributed over the

¹⁴ Federal Trade Commission Report, Pt. IV, Chap. II, p. 37.

¹⁵ *Ibid.*, Pt. III, Chap. III, pp. 129-130.

country as a part of or in connection with their branch houses. Most of the branch houses have large cold storage plants for the goods they receive, and many have surplus space to lease or let. In addition to the cold storage at, or near, their packing plants and in connection with their branch houses, the big packers have many cold storage establishments in the large cities, principally the eastern seaboard cities, which they use for long-time storage and for storing for export.

In ordinary times the securing of cold storage space is not a serious problem with the smaller packers, but a few such packers who shipped to the eastern cities during the recent war had some difficulties in securing refrigerated storage space, and indeed at that time the big packers also had the same difficulties. Ordinarily, however, in the large cities there is available to the smaller packer sufficient cold storage facilities to accommodate his current needs, though often his storage is not conveniently located for the needs of his business. In many of the small cities and towns cold storage facilities are not available to the smaller packers, so they must, if they do business in those towns, sell directly from the cars, whereas the big packers have their branch houses with cold storage equipment.

Cold Storage and Refrigerator Cars

The question of cold storage is one of hygiene, and the hygiene of the storage of meat products is closely allied with the hygiene of the transportation of these products. The principles of hygiene which guide to correct practice in storage guide also to correct practice in transportation. This leads to the subject of the development of the private refrigerator car lines. In this matter of transportation the practice cannot be the same as in stationary storage hygiene. A storage warehouse is not rigorously limited in height, weight, spaciousness, and all details of construction and management, but the car used for refrigerator service must yield to limitations in all

these things. Since, therefore, neither storage facilities nor hygienic control during transportation can ever equal those in stationary storage structures, it follows that the first and distinctive demand for hygiene is rapid transportation. The other requirements are naturally those common to all storage places for food products, namely, that only properly selected and prepared foods be received at all and that there must be maintained cleanliness, dryness, and an even low temperature.¹⁶

Fresh dressed beef after it has been inspected by government officials and is ready for transportation to branch houses or on car routes is placed in a refrigerator car. This is of the standard form of the ordinary large box car in current use, but one notices a difference in the massive tight fitting doors, in the heavy insulated walls, and finally in the clear varnished surface of matched boards which line the interior. Parallel rows of galvanized iron piping attached to the roof receive hooks from which hangs the meat. At the extreme end of the car are the ice bunkers, tanks of galvanized iron of varying form, but in any case extending from the roof nearly to the floor. Access to the interior of the ice bunkers is only through hatches on the outside of the roof, and drainage is carried off by pipes through the floor. Thus ice compartments and meat compartments are entirely separate, and the cold air which passes over the meat comes from a galvanized iron surface and not directly from melting ice. A board partition across the end of the car, several inches in front of the bunkers, but extending to within only about a foot of the floor and roof, protects the meat nearest the bunkers from freezing, and promotes circulation of air throughout the interior. In passing it may be noted that a new way to cool refrigerator cars, the automatic brine circulation system, has recently been tried out by Wilson and Company, Inc.

¹⁶ Chapin, Robert M., Senior Biochemist, Bureau of Animal Industry, U. S. Department of Agriculture, in *Transactions of Fifteenth International Congress on Hygiene and Demography* (1912), Vol. V, p. 21.

Loading Beef in Cars

The cars, which have been thoroughly cleaned and aired, are "precooled" before use by keeping the bunkers filled with a mixture of ice and salt for a day or two, so that at the time of loading, the interior temperature is close to or even below the freezing point of water. The car is run beside a platform upon which opens a door from the cooler, each side of beef swinging from a wheeled hook traveling upon an overhead rail. To lift the side of beef off, carry it in, and hang it up, takes so little time that exposure to an unrefrigerated atmosphere has been counted by seconds.

Once inside, the beef is packed compactly to prevent chafing when the car is in motion. There is plenty of space at top and bottom for air circulation, and of course innumerable vertical channels between. Very commonly the car is not filled solidly with beef, but carries a mixed cargo—dressed lamb, pork cuts, cured and smoked meats, lard—in fact, most packinghouse products. Such products as hides, bones, horns, hoofs, fertilizer, are of course shipped otherwise than in refrigerator cars. This system of loading tends to overcome one drawback to the refrigerator car, namely, different temperatures at different points in the car. Nearest the ice bunkers the temperature may be below freezing, and at this point can be placed such products as either demand or are not injured by a freezing temperature. Again, at the center of the car the temperature may be higher than is desirable for fresh beef, but low enough for the storage of lard and cured meats.

The car and every article going into it are subject to inspection by the Bureau of Animal Industry, and a certificate stating that the product has been inspected must be delivered to the railroad company, along with the shipment. In the large centers trains are daily made up of such cars, gathered from various establishments and hurried east, requiring about three days from Chicago to the seaboard, some 1,200 miles. The cars on this trip are iced three times with an approximate mix-

ture of ice and salt, at depots maintained for the purpose, so that the beef arrives at its destination at a temperature very little if any above that at which it left the cooler. It is unloaded and run into a cooler and subjected to inspection.

In a previous chapter the origin and early development of the refrigerator car was traced. It was the general use of the refrigerator car that induced the building of branch houses at advantageous points. These houses did no killing, but received the product from the car and stored it in refrigerator rooms or "coolers," until it was shipped to the local trade. It has been seen that, due to the hostility of the railroads, those few packers who were trying to introduce dressed beef into the markets of the country were forced to build and maintain their own refrigerator cars as a part of a national distribution system. In the course of years it was found desirable to form private car lines, as, for example, the Armour Car Lines and the Swift Refrigerator Transportation Company.

Why Packers Built Own Cars

The principal inducements for packinghouses in developing a national market to own the equipment were summarized by Commissioner Garfield in 1905 as follows:

(1) To secure adequate facilities—both as to number of cars and refrigeration service—and thus avoid delays and other inconveniences, which might occur if railroad companies were exclusively depended upon. The advantages of private cars are partly due (*a*) to the perishable nature of many products, which makes necessary an ample supply of equipment in order to secure prompt transportation, (*b*) to the uneven movement of many such products at different seasons of the year, as a result of which it is stated that the railroad companies do not provide sufficient equipment to handle the traffic when at its maximum; (*c*) an alleged indisposition on the part of the railroad companies to give proper care to cars employed in such services.¹⁷

(2) To secure the mileage payment allowed by railroad companies for the use of such cars.

¹⁷ Garfield Report, pp. 271-272.

(3) To secure incidental profits, particularly those arising from refrigeration. This applies, however, only to companies also owning icing stations.

The most obvious problem arising from the use of refrigerator cars in the distribution of packinghouse products is the relation between the private car lines and the railroads. Private cars are a recrudescence of the earliest practice when railroads were expected to furnish the roadbed and motive power and the shipper the vehicle.

For almost 40 years a struggle between the packers and the railroads has gone on, the packers seeking to extract higher mileage payments and other transport concessions, and the railroads attempting to keep down their payments for the operation of private cars.¹⁸

Refrigerator Car Efficiency

The efficiency of operation of refrigerator cars can be seen from the fact that the 18,052 cars operated by the larger packers in 1914 made an average of 80.3 miles per day, while the 16,599 cars in 1917 averaged 80.8 miles. The Federal Trade Commission comments on this achievement in these words:

Eighty miles per day throughout the year represents a very good movement for refrigerator cars even in normal times, yet this rate was maintained by the packers during 1917. Terminals were congested and the unloading of cars was therefore delayed. Embargoes and constantly changing priority of orders, a shortage of steel, coal and other materials, and severe storms and cold weather added to the railroads' difficulties in handling the business offered them. In the face of all these obstacles the big packers' cars were handled in the usual efficient manner.¹⁹

¹⁸ Federal Trade Commission Report on Private Car Lines, Chap. III, p. 43. Chief among the present factors of railroad operation of private cars are the following: Mileage and per diem payments, commissions, refrigeration and icing, car service, peddler cars, demurrage, Master Car Builders' Rules, mixing rules, and minimum weights.

¹⁹ Federal Trade Commission Report on Private Car Lines, Chap. II, pp. 92-93. The average miles per day for the cars operated by the larger packers during 1917 ranged from 76.9 miles for the Swift Refrigerator Transportation Company, to 104.3 miles for the Cudahy Packing Company. The very high rate for the Cudahy cars is in part due to the fact that this company considers its cars are in actual service only 292 days a year; while the others consider their cars operate from 309 to 340 days per year. Some time is of course normally lost in repair shops.

The cars of the smaller packers did not make as good a showing, averaging some 72.1 miles per day in 1914, and 54.5 miles in 1917. "The difference is accounted for in part by the fact that the larger packers' cars have on the average a longer run than the cars of the smaller companies." The movements of the former are also traced by the traffic experts of the larger packers. The greatest difference was in the trunk line territory between Chicago and the Atlantic seaboard.

Contracts between railroads and packing companies have been entered into with the thought of increasing efficiency. These contracts are of three kinds: (1) agreements between shippers owning private cars and railroad companies, in which the shippers usually promise a certain amount of traffic and the railroad companies fix mileage rates and also maximum freight rates on goods transported; (2) contracts between private car companies (which are not also shippers) and railroads, under which the railroads pay certain commission on the freight rates over and above the regular mileage rentals, on goods transported in the car companies' cars over the lines of the railroads; and (3) contracts by which the railroad promises to use exclusively the cars of one particular private company for some particular class of traffic. This last is called the "exclusive" contract and is now out of date.²⁰

Refrigerator Car Earnings

Earnings of the refrigerator cars have been a source of considerable profit in themselves to the packing companies, though not the reason for their continued ownership of them. In order to compute these it is necessary to have the following data: (1) the mileage rental, (2) the average daily mileage of cars, (3) cost of cars, and (4) expenses. Taking all these items into consideration, in 1904-1905 refrigerator cars used

²⁰ In connection with this topic see: Celd, L. D. H., *Private Freight Cars and American Railways*, pp. 91-92, 140, 147; Garfield Report, p. 272; *Railway Age*, Vol. XXXV and XXXVI, articles by J. W. Midgley; Federal Trade Commission Report on Private Car Lines, p. 106.

in the shipment of dressed beef and provisions earned from 17 to 20 per cent on their value. In 1912 it appears that the refrigerator car lines of the larger packers made an average profit of 6.8 per cent on the investment. In 1914 the average was 3.8 per cent, and in 1917, 4.6 per cent. For the six years the average rate for all the car lines of the larger packers was 5 per cent. Among the smaller packers engaged in interstate trade the Kingan Refrigerator Line netted 4.7 per cent a year on the total investment for the six years, and 8.3 per cent on the basis of the capital stock issued.

Several factors contributed to the decline in the percentage of return on the investment in the last fifteen years. Among them were the increased cost of maintenance, repairs, replacement of parts and cost of building new cars. Depreciation is a larger item in consequence and overhead expense is slightly greater. There was until the recent increase in the mileage rate paid for the use of refrigerator cars from three-fourths of a cent to one cent per mile, no increased revenue to offset the added expense, except through expedited movement of cars adding to the mileage returns.

Peddler Car Routes

To move their products quickly and in good condition on regular schedules the larger packers have developed a system of refrigerator car routes, or "peddler car" routes, as they are called, which taps a market outside the great urban consuming centers of the country which is untouched by the branch houses proper because its population is too sparse to warrant it. These car routes are mostly used as a distributing method in the great livestock producing and feeding regions in the prairie states from Oklahoma northward, including the states of Kansas, Missouri, Kentucky, and Iowa.²¹ In these states more than 16,000 towns are reached, for the cars can be run wherever there are tracks and new markets are easily developed at small

²¹ Federal Trade Commission Report, Pt. I, Chap. III, p. 143 *et seq.*

expense. Nearly 9,000 towns are thus reached in the seven states neighboring the former tier on the east—Wisconsin, Michigan, Ohio, Indiana, Kentucky, Tennessee, and Arkansas.

The subject of these peddler car routes from the point of view of physical distribution of the product, divides itself naturally into two parts, one dealing with the packers' arrangement for the delivery of less than carload shipments, the so-called "peddler car service," the other with carload shipments, especially to branch houses. The car route sales of the larger packers amounted to about 775,000,000 pounds of food during 1916. A relatively small portion of this was delivered by express or other equipment supplied by the carriers; but the bulk of it was delivered to thousands of towns in all sections of the country by refrigerator cars, mostly owned by the packers.

How Peddler Cars Arose

The term "peddler car" had its origin in an early practice of selling meats and other perishable foods from cars en route, a practice no longer followed so far as the distribution of meat is concerned. At present the car routes of such an organization as Armour and Company radiate from various headquarters, such as Chicago, Kansas City, East St. Louis, Omaha, St. Joseph, and Fort Worth, but this is the result of steady and persistent growth. In the early eighties, at a time when branch houses were in their infancy, Armour and Company was looking for a method of marketing the increasing supply of hams and lard. It was felt that some way must be found to realize on the consequent increasing supply of fresh cuts, such as pork loins, Boston butts, spare ribs, etc. Distant points were of no avail on account of lack of refrigeration service, so a salesman was sent out from Chicago with a carload of this fresh product to peddle out to the small town meat market men who met the train. Sometimes the car would cover 200 miles before it was cleared, and sometimes only 70 miles. The trad-

ing was worthy of bigger business. Of course all products were sold in original packages, but it required agility, as the salesman had to be through when the train gang had finished unloading the freight for that point.

In 1887 the first two regular car routes were established by Armour and Company, one in southern Wisconsin and Minnesota and the second in northern Indiana. At first all the product was peddled, no part being sold previous to shipment. The routes established were not as now along strips of railroad studded with small towns, for it was considered that better results could be obtained if the cars traveled in circuit fashion, starting out and winding up at the point of shipment. This growth of car routes made possible a little later the establishment of branch houses at many places as the economic need arose.

Peddler Car Procedure

The peddler cars are loaded in station order by the packers' employees at the loading docks of the packinghouse with orders secured by traveling salesmen, through the mail, or otherwise. The contents are checked, according to rule, by railroad employees. The cars are iced by the packer and when re-icing is necessary it is done at his expense. Loaded cars are switched to the interchange tracks of the receiving carriers. If, as is usually the case, a car is not to break bulk until it has reached some distance from the point of shipment, this car is put into a train with other cars entitled to expedited service and forwarded to, or near, the town where the peddling route begins. The train may thus carry several meat cars 200 or 300 miles as time freight, and then be broken up at a division point to go into way-freight trains, each with its one or more meat cars. The consignments to the various stations are unloaded by the railroad employees.

The haul for a route car varies greatly in length, from 25 or 30 miles, to 900 or more. A typical car route in the Central

West involves a haul of from 250 to 300 miles in length. The number of towns on the peddling route varies from 2 or 3 to 15 or more. Many towns not reached directly by the packers' car are served by it, nevertheless, by transshipment at junction points, or to points beyond the final destination of the car. From the end of the route the car, usually empty, is hauled back to the plant, the packer receiving mileage on the movement of the car, both loaded and empty.²²

Somewhat analogous to the extensive car service furnished by each of the big packers for his exclusive use, is the scheduled refrigerator service provided by many carriers on some parts of their lines for the general public, including the packers who often make use of it. The freight rate is the same whether shipment is moved in a peddler car or in a railroad scheduled car. In all cases the rate on each consignment is the less than carload rate from place of origin to destination. In order, however, for the packer to secure the special service that goes with the exclusive use of the peddler car he gives certain guarantees as to weight or earnings, or both.

Use of Motor Trucks

To turn from the railroad transportation of meats, to that by wagon, for short hauls, probably the most significant feature is the constantly extending use of motor trucks.²³ Better protection for the meat through the possibilities of heavier construction and far more rapid transit than by horse and wagon, are other important hygienic advantages of the motor truck. The trucks used by the large establishments are usually of the van type, with no opening at all in front and with tightly closing doors in the rear. The meat is thus surrounded with wooden walls which, being specially insulated, protect it from the outer heat as well as from moisture and dirt, so that it may

²² Federal Trade Commission Report, Pt. IV, Chap. II, pp. 57-58.

²³ For more detailed treatment of the use of autotrucks by the packers, see *System Magazine*, Nov., 1919, "Jobs that Motor Trucks Do Better," by R. A. Clemen; also publications of the Institute of American Meat Packers.

be delivered in prime condition as far as 30 miles away. For loading, the trucks are backed to a platform upon which opens a door from the cooler, and the beef is carried out on the shoulders of men dressed in clean gowns or provided with clean white carrying cloths. The floor of the truck is either strewn with fresh straw or covered with clean canvas on which the meat is compactly piled.

Fresh carcass meats (i.e., other than fresh beef subject to inspection by the federal government) are handled in essentially this way. Small cuts, such as pork loins, are wrapped in non-absorbent paper and crated before shipment.²⁴ Boxed, barreled, or crated goods and cured and smoked meats are naturally much less susceptible to outside influences than is fresh meat, yet the bulk of such products is handled in practically the same way as fresh meat. Quality and selling value are thus kept at the highest point, and since in any event refrigerator cars and vehicles of special type must be provided for fresh meats, the large establishments generally find it good business policy to use the same cars and vehicles for practically all their products. When shipments of small cuts of fresh meats must be made over considerable distances and in less than carload lots the ice box is employed. This is a rectangular galvanized iron box, provided with a tight cover and fitting into a similarly large shaped, but considerably larger wooden box. The space between the two boxes is packed with crushed ice which may be renewed as occasion demands. Shipments of this sort are common on inland waters as well as by rail.

The significance of these auto truck routes is seen when it is stated that 20,836 towns are reached by Armour's auto truck system, about one-fourth in the south central states and one-fifth in the north central states. In New York State there are over 1,000 Armour's truck towns and also in Pennsylvania and Virginia. In Texas there are nearly 1,600.²⁵

²⁴ Chapin, *op. cit.*, p. 22.

²⁵ Federal Trade Commission Report, Pt. I, p. 144.

Large-Scale Marketing Efficient

While many packers do a business within a rather short radius, the industry has tended constantly toward large-scale centralized organizations of marketing for supplying the needs of the national and international meat trade. The question now arises: Is this large-scale organization of marketing for national and world markets in the interest of the public? This subject was discussed at the American Economic Association, December 31, 1919.²⁶ It was pointed out by Mr. L. D. H. Weld of Swift and Company in an able exposition of the subject, that the packing industry represents large-scale marketing in these ways: (1) Each of the large packers does a large volume of business in its principal products, meats; (2) each has undertaken the marketing of other products than strictly meat foods, although the extent to which this has been done varies for the different packers; and (3) the large meat packer represents a more direct system of marketing than is found in most trades in that "he does his own jobbing" and sells direct to the retail dealer. There is, therefore, in addition to large volume, the branching out into other lines, and the integration of the marketing processes.

The packing industry is a combination of manufacturing and selling. There is a real need for large manufacturers in order to bring about the greatest possible utilization of by-products and it is also necessary to have the plants large enough to be able to absorb the fluctuating receipts of livestock that come to market. Many small packers are called "in-and-out-ers," because they buy when the market looks right to them and stop buying when conditions look unfavorable. The large packer varies his buying to a certain extent, but on the whole makes it possible to absorb the receipts of livestock that come to market, whether great or small.

²⁶ Proceedings of the American Economic Association, 1919. The argument for large-scale marketing is based principally on the statements of Weld, L. D. H., Manager, Commercial Research Department, Swift and Company.

Need Large Distribution Organizations

Important as it is to have large manufacturing companies, it is equally important to have large distributing organizations in the packing business. The greatest advantage in a large distributing scheme organization is that the large packer in Chicago, or other western cities, can keep directly in touch with trade conditions, and can distribute his highly perishable meats to various markets more efficiently in accordance with varying demands than was possible when he depended upon outside wholesalers for his market. The reason that he can afford to do this is that he has such a large volume of business to do through each branch house that the cost of operating these branch houses is reduced to a minimum. Swift and Company's cost of operating branch houses is only about 4 per cent of the sales, and this includes an overhead administrative charge from the Chicago office.

It is clear that no small packer in the West can afford a comprehensive sales organization in the East. A small packer might have enough business to maintain one branch house in New York, but unfortunately this one branch will be wanting choice cuts of beef one week and cheap cuts of beef the next week. Demand for beef will be falling off in New York when livestock receipts are increasing in the West, or vice versa. In other words, the western packer must have a large number of distributive outlets in various consuming centers before he can market his meats efficiently.

This is one of the reasons why the larger packers have branched out into the handling of other commodities, but there are other reasons as well. In the first place, long ago they found that in their refrigerating equipment in the form of storage houses, refrigerator cars, and cooling rooms in their branch houses, they could handle to advantage such commodities as butter, eggs, cheese, and poultry. They found that they had to add some overhead expense in the way of administration to their Chicago headquarters, but that much of the exist-

ing administrative machinery could also be utilized. These goods could be sold to the same class of retailers by the same salesmen and delivered in the same delivery trucks. In general, the same accounting force could attend to the making out of bills, etc. In other words, they could increase their volume of business without a commensurate increase in overhead expense for administration and for physical equipment. This increased tonnage not only made it possible for the larger packers to handle these related commodities expeditiously and economically, but enabled them to have distributing houses for meats where otherwise the tonnage would not be sufficient, and in general this increased tonnage decreased, or at least kept down their selling expenses on meats. At present the marketing expenses, including freight on their goods, constitute well over half of the total expenses of Swift and Company. In that sense, this company is more important as distributor than as manufacturer.

Distributing Functions of Packers

To summarize the functions of the packers, in assembling, the packers are in touch with the producing sections. They have established their assembling plants for butter, eggs, and poultry in such states as Iowa, Missouri, and Kansas, thus permitting them to assemble to the best advantage, and at the same time to furnish a never-failing market for producers. In storing, they have warehouses and refrigeration facilities in connection with their numerous packing plants, and they have refrigerator cars and refrigerating facilities in connection with their many branch sales houses, which can be used for these products, as well as for meats.

In financing, the packers are borrowing from banks throughout the country in connection with their business, and can easily use the same sources of credit for their other products. As for the assumption of risks, they are in a position to minimize the risks involved, through having a nation-wide

organization which is in constant touch with the changing conditions all over the country, and they have such a wide distributive outlet that they can store goods only to satisfy their own trade requirements, rather than as purely speculative ventures.

When it comes to grading, sorting, and packing, the packers reduce the number of times that goods must be sorted and rehandled by their direct shipment from assembling plants in the West to branch houses in the East, and they are in a position to bring about a greater uniformity and standardization of grades than is customary. As for the selling function, the packers utilize their sales organization in such a way as to reduce unit selling expenses. In performing the functions of transportation they bring about a more exact distribution of goods by having control of their own refrigerator cars, and they utilize the same delivery trucks that are necessary for carrying meats to the door of the retailer.

The advantages the packers have over the ordinary distributive machinery in the handling of these products are obvious, and yet they are not so great, measured in dollars and cents, as would appear at first sight. They still have to render all the functions that are performed by other middlemen. They do not aim necessarily to undersell them, and yet it is a fact that they set the pace in competition. When a purchaser in New York wants a large quantity of eggs, Swift and Company, for example, is not only likely to be able to make the best price, perhaps only by a fraction of a cent per dozen, but it is likely to have goods available in New York or en route from some Kansas point, which will just fill the bill. The advantage is perhaps even more in respect to service than it is in respect to price.

Benefits Both Producer and Consumer

Through their central organization, which is constantly in touch with hundreds of sales outlets, packers are able to dis-

tribute most efficiently their supplies in accordance with varying demands, and they are more likely than perhaps any other distributor to have goods on hand at any particular point. This all means better organization, more scientific marketing, and greater benefits to both producer and consumer than are possible under an organization consisting entirely of small units.

The different packers have had varying opinions as to the economies obtainable by branching out into other lines. Armour and Company, for example, during the war went into such products as coffee, rice, cereals, etc. Outside of butter, eggs, cheese, and poultry, Swift and Company has taken on practically nothing but canned goods, and a little dried fish. In this connection, there is left out of account the manufacture and sale of leather, soap, oleomargarine, fertilizer, etc., which are industries that carry to a further degree of manufacture the by-products of animals.

The outlines of the modern distribution system of the packing industry were completed by the middle nineties. By that time it was clear that a packing company to give efficient interstate service must develop a branch house and refrigerator car organization. Without that it could and would be only a local business. The story is told of Henry Botsford in Chicago, who sent out a circular to the directors of his company asking for a consideration of this problem. He declared in the circular that if the company went ahead it must have a modern system of distribution. If it did not have such a system it would never become important. The directors decided against the forward step. Botsford's prediction came true.

CHAPTER XVIII

COST ACCOUNTING IN THE PACKING INDUSTRY

Practice Differs from Others

The cost finding and accounting practices in the packing industry have been often misunderstood simply because they apparently are so different from practices in other industries.¹ Much confusion and some criticism in the past has resulted from a lack of understanding of the principles underlying packinghouse cost finding and accounting procedure. The differences are not differences of principles, for the practices in this industry are based on sound accounting and business principles. The differences in the accounting are the results of the diversity in the character of the operations performed. The Standardized Cost Accounting Committee of the Institute of American Meat Packers, which has made a special study for some time, working out suggestions and recommendations as to the handling of packinghouse cost and accounting procedure, has confined its efforts largely to the specific problems arising in the industry.

Following the principles worked out as a result of that careful study, the present chapter has for its purpose the explanation of some of the peculiarities in packinghouse accounting procedure and the contrasting of these practices with those prevailing in other industries. In this chapter also an effort

¹ The material for this chapter has been furnished through the courtesy of Mr. J. H. Bliss, Chairman, Committee on Standardized Cost Accounting, Institute of American Meat Packers. For further study reference is made to the following sources: The Theory of Packing House Accounting; Tentative Draft of Proposed Accounting Instructions on the Cattle Business; and Tentative Draft of Proposed Accounting Instructions on the Hog Business—all three studies being prepared by the Committee on Standardized Cost Accounting of the Institute of American Meat Packers. See also Putnam, George E., "Joint Cost in the Packing Industry," *Journal of Political Economy* (Apr., 1921), Vol. No. 4; and "Unit Costs as a Guiding Factor in Buying Operations," *Ibid.* (Oct., 1921), Vol. XXIX, No. 8.

is made to contrast and explain the cost finding and accounting procedure prevailing in the packing industry with that of other industries, without entering into an exhaustive or detailed discussion of either.

Three Types of Cost Finding

In a general way, and from the point of view of cost finding, the various types of manufacturing operations may be divided into three classes, each requiring a particular method of figuring or cost finding. These may be stated as follows:

1. Costs for ordinary manufacturing operations.
2. Costs for operations producing major products and by-products.
3. Costs for operations producing joint products.

It is the character of the operations that makes differences in methods of cost figuring necessary and determines the type of cost finding to be applied to any specific kind of business. It is fundamental that the method of cost figuring should fit the particular operations to which it is applied. In the consideration of any accounting or cost finding method, the first information to be developed is, "What are the operations and transactions to be recorded?" Then the cost computing and accounting procedure must be handled in a method adapted to these particular operations and transactions.

In the packing industry are found many and various operations. All three types of operations mentioned above are represented in the various branches of the business. Therefore, in the cost finding and accounting for that industry each of these various types of costs is utilized. To each kind of operations or transactions is applied the most appropriate cost computation and accounting method.

Costs for Manufacturing Operations

Ordinary manufacturing operations, as found in the great majority of industrial enterprises, consist of the putting

together or building up of materials, labor, and expenses into a finished product. This is the most common type of manufacturing operations, and is generally thought of when cost figuring is mentioned. The steps in such cost finding would be as follows:

1. A known amount of material of a determinable cost is used.
2. A definite amount of labor of ascertainable cost is expended.
3. An average amount of overhead expense is absorbed.
4. The whole is the cost of the finished product.

This represents the steps in cost figuring for the ordinary type of manufacturing operations and is commonly known as "cost finding."

This method of cost figuring is applicable to all businesses having ordinary manufacturing processes, such as the manufacture of automobiles, the manufacture of soap, the manufacture of foundry products, the manufacture of furniture, etc., and, in fact, the manufacture of anything, the operations of which are the putting together and building up materials, labor, and expenses, into a finished product. A varied and somewhat different type of operations are those which involve the taking apart or breaking down of some materials of known value into several or many parts, of which one is the major product and the others by-products. All of these products being derived from the same material are in the nature of joint products, that is, all produced out of something of known cost by the same operations. It is impossible to determine the cost of each product separately, although the cost of all may be figured.

Major and By-Product Costs

The cost of the major product from such operations is usually computed in the following manner:

1. Starting with the known cost of the materials used ;
2. Add the costs and expenses incurred ;
3. Making the total outlay ;
4. Deduct therefrom the value of the by-products produced ;
5. The balance is the cost of the major or prime product.

It should be noted that by this method of figuring, the cost of the prime product is arrived at by deducting from or crediting to the total outlay the full value of the by-products produced. The costs of such by-products are not ascertainable and the cost for the major product would not be ascertainable except by deducting from the total outlay the full value of all of the by-products produced.

The problem of costs for major products and by-products is found in several industries, including such as the petroleum oil industry, the production of many farm products, the production of gas, coke, etc., by gas plants, and the cattle business in the packing industry. This method of cost figuring was recognized by the United States Tariff Commission in figuring the cost of wool, mutton being the by-product, and also in figuring the cost of mutton, wool being the by-product. It is essential in figuring the cost of major products that the full value of by-products be credited. By "full value" of by-products is meant the marketable value of such by-products in their first commercial stage, less any costs and expenses to be incurred in processing them to such stage, and in marketing them. This gives the full value of the by-products in their present form at the time of production, and is the valuation to be used in cost figuring. If an arbitrary or different valuation were used, the cost of the major product would not be determined correctly.

By this method of figuring the results of the entire operations—the profit or loss—appear upon the disposition of the major product. The by-products, having been figured at their full value, should not show either profit or loss when disposed of, except as market conditions change or costs of processing

and marketing have been over or under estimated. This is the only known method of figuring costs when major products and by-products are produced out of the same operations, and is customarily applied to such businesses.

Joint Products

The third type of operations are those which are the taking apart or disintegration of something of known cost into several or many parts, none of which may be termed "major" products. They are simply joint products, that is, many products resulting from the same operations performed on a material of known cost. Being joint products it is impossible to figure the cost of each separately, though the cost of the whole group might be readily computed. For such operations it is almost always impracticable to apply an average cost to all of the various products, for the reason that usually some are high grade and of relatively high value, while others are of medium or lower grades with relatively lower values, and an average cost would, therefore, be entirely misleading.

Cost Finding for Joint Products

The practice in cost finding for such operations producing joint products is, therefore, about as follows:

1. Figure the value of all of the products derived from the given operations.
2. Figure the cost of materials going into such operations.
3. Figure the amount of expenses incurred.
4. The total of the materials and expenses makes the total outlay.
5. Compare the total cost expended to the total value of all products derived, arriving at the margin of profit or loss between the total costs and total value of products made.

This method of figuring costs emphasizes three points, namely:

The total cost or outlay.

The total value of the products made.

The margin of profit or loss on such operations.

In some cases the values of these various products may then be adjusted by spreading the profit or loss shown on the entire production, that is, the value of each of the products may be reduced by a portion of the profit or increased by a portion of the loss, so that the total value of the products as a group is adjusted to the total of the outlay. The effect of this procedure is simply to spread the total cost over the various products made, on the basis of the relative market values of the various products. In other businesses this adjustment of spreading the profit or loss over the products is not made, especially if such products are merchantable commodities and may be marketed in their present stage or passed on to other departments of the business for further manufacturing, in which processes their identity is entirely lost. The reason for this will be made clearer later.

Problem of Joint Costs

The problem of joint costs exists in several industries, e.g.:

THE SORTING AND GRADING OF TOBACCO. Several grades of different values are sorted out of a given amount of tobacco purchased at a certain price. The costs of the various grades sorted out are figured by spreading the total outlay over the various grades on the basis of the relative market values of such quantities of each grade.

THE GLUE BUSINESS. Various grades of glue are produced out of the same operations. The total cost of the processing is spread over these different grades made, on the basis of the relative market values of such quantities of each grade produced.

THE COTTONSEED OIL INDUSTRY. In the cottonseed oil industry, oil meal, hulls, linter, etc., are produced by the crushing of cottonseed. Each product being a merchantable com-

modity in the form produced, the practice in this industry is to compare the cost of seed crushed to the total value of the products produced, arriving at the gross margin realized on such operations. The net results are then determined by deducting the expenses from this gross margin.

THE HOG BUSINESS OF THE PACKING INDUSTRY. An example of this will be shown later.

Need Special Analysis

These are not costs as ordinarily thought of. In fact, the usual methods of cost figuring cannot be applied to operations like these producing joint products. The cost figuring and accounting has to follow and fit the operations. The differences between ordinary costs and costs of joint products may be illustrated by the building up of an automobile and the taking apart of a second-hand automobile. In the building up of an automobile, costs may be figured in the customary manner. Known quantities of materials, parts, labor, and overhead are expended, and the totals thereof make the total cost of the finished automobile. On the other hand, assume the purchase of a second-hand automobile for a certain sum, and proceed to dismantle it. The problem of joint costs would be like attempting to determine the cost of the engine or any part of it, or the cost of a fender, or a tire, or any other part from an automobile, when the only facts known are, first, the total cost of the machine as bought, and, second, the expenses incurred in dismantling. Obviously the costs of any of these parts cannot be determined. The cost of all of them as a group may be figured, but not the cost of any one item. It is a matter of joint products.

We are all quite familiar with the cost figuring procedure for ordinary manufacturing operations, and little time need be spent in elaborating on that. It is simply a putting together of materials of known costs, a determinable amount of labor,

and an average amount of expense, into a finished product. This method of cost figuring is used in the packing industry wherever it is appropriate. It is applicable to such operations as the

- Manufacture of sausage
- Manufacture of soap
- Manufacture of oleomargarine
- Manufacture of boxes
- Manufacture of cooperage
- Manufacture of commercial fertilizer
- Manufacture of canned meats, etc.

Cost Figuring for Cattle

The cattle business in the packing industry is a good example of that class of manufacturing operations producing major products and by-products. Dressed beef is the major product from this operation. By-products include hides, oleo oil, stearin, tallow, tongue, other edible small products, bones, horns, hoofs, tankage, fertilizer. The dressed carcass of beef is the largest single product made from cattle by these operations and represents about 50 to 60 per cent of the live weight. This is the prime product produced in the slaughtering and packing operations in the cattle business.

Beef is customarily marketed at wholesale in the form of dressed carcasses, either as quarters or sides, or whole carcasses. When the beef carcass is received by the retailer, it is cut up into various parts, such as roasts, steaks, etc. The retailer faces a problem in joint costs. He knows what the whole carcass costs him, knows what the various cuts that he makes from it are worth. He knows that the market value of these different cuts varies widely, and he is, therefore, unable to apply or spread the total cost over them on any average basis. These retail cuts are simply joint products for which individual costs cannot be computed.

Representative Results

Since the beef is customarily marketed in the form of dressed carcasses by packinghouses, it is the one major product resulting from the cattle operations. Table I is an example of cost figuring for a representative lot of cattle.

TABLE I

EXAMPLE OF COST FIGURING FOR LOT OF CATTLE

1. Live cost 46 head, weight 52,390 lbs. (avg. 1,138), native steers, at \$7.....	\$3,667.30
2. Expenses, killing, dressing, chilling (estimated for month)....	118.03
3. Allowance—Condemnations, trimmings, etc. (average).....	17.77
<hr/>	
Total outlay on lot.....	\$3,803.10
4. Less credit for hides (cured values less expenses curing and marketing).....	387.06
5. Less credit for fats (value of products less expenses).....	116.30
6. Less credit for other by-products (value of products less expenses preparing).....	125.73
<hr/>	
Total by-products credits.....	\$ 629.09
<hr/>	
7. Balance—Plant cost of carcasses, in cooler.....	\$3,174.01
8. Dressed carcasses weighted 29,615—yield 56.53% of beef....	
9. Average dressed cost per cwt.....	\$ 10.72
10. Add selling costs and expenses.....	1.87
11. Total cost of lot, per cwt.....	12.99

Live Cattle and Beef Spread

It will be noted that this example emphasizes clearly the effect of the yield of beef on prices, creating the spread between the live price and the cost of the beef produced. The total live weight was 52,390 pounds and the weight of the dressed beef only 29,615 pounds. This is a yield of 56.53 per cent of beef out of the live weight. The live cost was \$7 per hundredweight, which means \$7 for each 100 pounds of live weight. Considering that the yield of beef is only 56.53 per cent, this would have the effect of almost doubling price as applied to the dressed beef produced. This is the most important single factor in accounting for the spread between the

cost of live cattle and the cost of dressed beef, and is probably one of the most confusing factors in the mind of the average consumer. Note also that the value of the by-products is considerably in excess of all the expense, so that the dressed beef might be sold at a good margin over cost and still for less money than was paid out for the live animal.

The credit for hides is arrived at in the following manner: From the current market price for this particular grade of cured hides is deducted sufficient to allow for the shrinkage and expenses in curing and marketing. This gives the present value of the green hides per hundredweight. This price is applied to the actual weight of hides produced by each lot. The credit for raw fats is likewise figured backwards. Starting with the market value of the yield of oil and stearin from fats, the expenses of rendering and marketing are deducted and an allowance is made for the yield of such oils and stearin. This gives the basis for valuing the fats produced from each lot in their present raw state with a fair degree of accuracy. The credit for other by-products, which includes everything else produced out of the animal, is all computed in the same manner. That is, from the values of the finished products at current markets are deducted the expenses of preparing and marketing, which gives the present value of such by-products in their raw state.

Determining By-Product Values

The values of by-products should be determined on the basis of current market prices, for that is the only known foundation. It is impossible to predict what the market for these by-products may be 30, 60, or 90 days hence, when they are disposed of, and to use other than the present market in figuring their values would be merely guess-work. When the current market price is used, any loss or gain realized upon the ultimate disposition of the by-products will be made up of two factors: (1) loss or gain due to changes in market values

of by-products between date of slaughter and date of sale; (2) loss or gain due to adjustments in expenses and yields. As the by-products are figured at their full value, based upon the present market, it follows that the results of these transactions will show as a profit or loss in the disposition of the beef.

These results shown on the disposition of the beef, being the profit or loss between the cost as figured and the price sold for, are subject to periodical adjustment as follows: (1) loss or gain on realization of by-products; (2) difference in expenses between estimated and actual. Applying these adjustments gives the final results, profit or loss, on the cattle business as a whole. Since cattle are customarily bought in the central livestock markets in lots ranging from one or a few head to several carloads, it is usual that the lot as bought is the basis for cost figuring. In some cases purchases of small numbers may be combined into one lot for slaughtering and cost figuring purposes, especially if they are of the same kind and grade.

Almost all of the beef products are sold fresh and have to be marketed within a very limited time after slaughter. The markets for beef and for beef products are changing from day to day. It is necessary, therefore, that the costs of these lots killed daily should be figured within a very few hours after the operations take place. This necessitates estimating expenses and yields of various products on the basis of averages. Hence the results in the beef business within a period, for a day or a week, may be subject to some minor adjustments, but when the business for a period is considered and the adjustments for expenses and by-product values are applied, these become the final figures for the cattle business. Dressed beef is customarily inventoried at cost, for costs are figured and are available. By-products, however, are customarily inventoried on the basis of market values, for no other values are or can be determined.

Joint Products in Hog Business

The hog business in the packing industry is a good example of operations producing joint products. Pork products are customarily marketed in the form of cuts, loins, hams, bellies, shoulders, etc. Very little pork is marketed in the form of a dressed carcass, as is the case of dressed beef. Another feature of importance to be noted is that part of these pork products may be marketed fresh, as is usually the case with loins, butts, etc., and other parts will be cured and smoked and finally marketed in the form of bacon, smoked hams, etc. The hog business differs from the cattle business essentially in that there is no one major or prime product. It is purely a case of joint products, or many products made by the same operations, out of certain raw materials of a known cost.

Table II shows an example of how a test on a lot of hogs would be figured. It should be noted that it follows quite well the procedure already mentioned. The yield column shows the pounds of each kind of product produced out of each 100 pounds of live weight on the average for the lot. Applying the current price to this amount of product, as extended, gives the value of each product out of 100 pounds of live weight. For example: This lot produced, on the average, $13\frac{1}{2}$ pounds of fresh hams for each 100 pounds of live weight. These hams were worth 13 cents per pound. Hence the hams produced were worth \$1.76 per 100 pounds of live weight. So with each other product. The complete test is given in the table on page 422.

This is the method used in figuring a test on a lot of hogs and provides the information needed by the management in following the markets, and judging whether or not it is profitable to buy at prevailing prices. It should be noted that it emphasizes the following points: (1) what all of the products are worth at the present market reduced to a live weight basis; (2) the expenses of operation; (3) the cost or present market value of live hogs.

TABLE II
TEST ON LOT OF HOGS
Lot of Hogs of Average Live Weight of 250 Pounds

Product	Weight (lbs.)	% Yield Out of Live Weight	Current Market Price (cents)	Extension
Fresh hams.....	16-18	13½	13	\$1.76
Fresh shoulders....	12-15	10	10½	1.05
Fresh bellies.....	14-16	12	11¼	1.35
Fat backs.....	8-10	7	7	.49
Pork loins.....	8-10	10	14½	1.45
Spare ribs.....	....	1	11	.11
Prime steam lard...	....	14½	8	1.15
Trimnings.....	....	2	7½	.15
Miscellaneous.....	....	3	4	.12
<hr/>				
Yield and gross value		73	....	\$7.64
Expenses (per cwt., alive).....				.62
<hr/>				
Hogs per cwt.				\$7.02
Hogs cost.....				6.70
<hr/>				
Profit per cwt., alive.....				\$.32

Department Credits and Debits

Obviously the difference between the value of the products and the total costs would represent the profit or loss between the markets at these figures. This is the method that a man doing a hog business would use in figuring whether or not his purchases were profitable, and in judging whether or not it would be advisable to extend operations. These figures also indicate the basis upon which the fresh pork or killing and cutting department is usually established in most packing-houses. Such a department would draw together the following figures:

As charges to the department:

The cost of the hogs purchased.

All expenses incurred.

As credits to the department:

Value of all products sold or transferred from it.

These factors, together with the inventories at the beginning and end of the period, make up the fresh pork or killing and dressing departmental accounts, indicating the profit or loss for a period on current hog business operations. This statement emphasizes as well that there is no one major product in the hog business. It should be noted further that no one item produced is as much as 15 per cent of the total live weight of the hog. Another point of importance is the wide range in the value of the products realized, from the highest, pork loins at 14½ cents per pound, to trimmings, at 7½ cents per pound. Inventories of such hog products are necessarily valued on a market basis. There are no actual costs for the various products. As these products move throughout the various processes and manufacturing operations, the identity of specific items is lost, so that the only available basis for valuing inventories is the current market for such products.

Departmentization a Feature

Departmentization of the business and of the accounts is one of the features of the present-day packing organizations. Departmentization is necessary because of the large variety of operations and activities which any sizable modern plant conducts. Any plant may have a variety of operations peculiar to itself, and will naturally have to be departmentized on a plan particularly adapted to its physical layout and operations. Some plants handle only a cattle, calf, and sheep business. Others may handle only a hog business. Some will handle all classes of livestock. Some plants do not process by-products to any extent, but dispose of them raw or in the lesser stages of manufacture, while others process their by-products to various degrees. Some plants do not engage in allied industries, while other organizations may have allied businesses, such as glue, soap, fertilizer, etc. The handling of the business and accounting, therefore, requires careful and logical depart-

mentization, appropriate to the particular plant and its activities.

Cattle Departmentization

In the cattle business the departmentization should fit the operations and support the cost figuring and accounting procedure. Figure 24 (a) indicates briefly a general plan for departmentization of the cattle business. This will of course be varied somewhat to meet local conditions, but the general

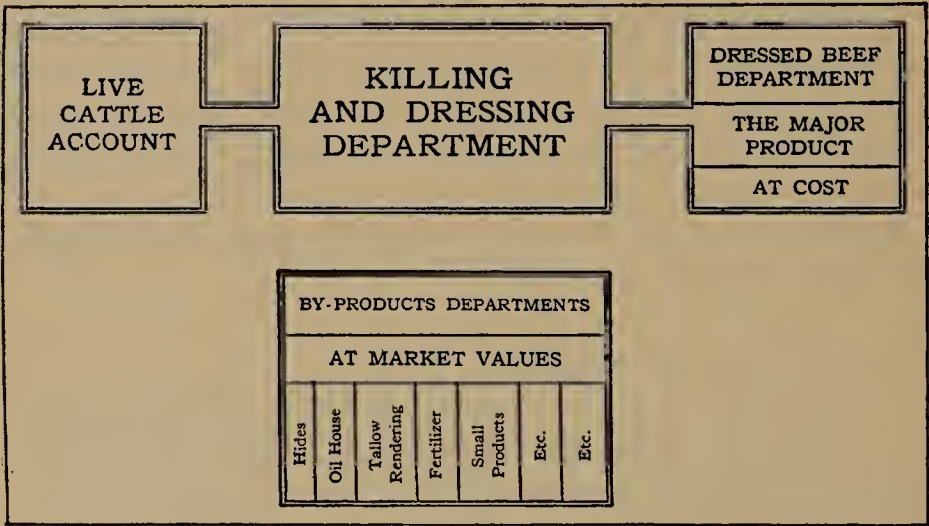


Figure 24. (a) Chart Showing Departmentization of Cattle Business

plan will usually be found about the same in various establishments.

The departmentization of the hog business will naturally be somewhat different because the operations and processes differ materially. One of the outstanding features of the hog business is that the operations are a succession of processes. The dressed carcasses are customarily divided in the form of cuts—hams, shoulders, loins, bellies, etc. Some of these may be sold fresh, some may be put into cure, some may be carried in storage from a period of surplus production to a period of scarcity. As the product comes from cure, some of it may be

sold in that stage, and some of it processed further, into the form of smoked hams, bacon, etc. Each one of these various processes :

Killing, dressing and cutting
Storage
Curing
Smoking, etc.

is in fact a distinct competitive industrial business, and the departmentization has to recognize these peculiar features.

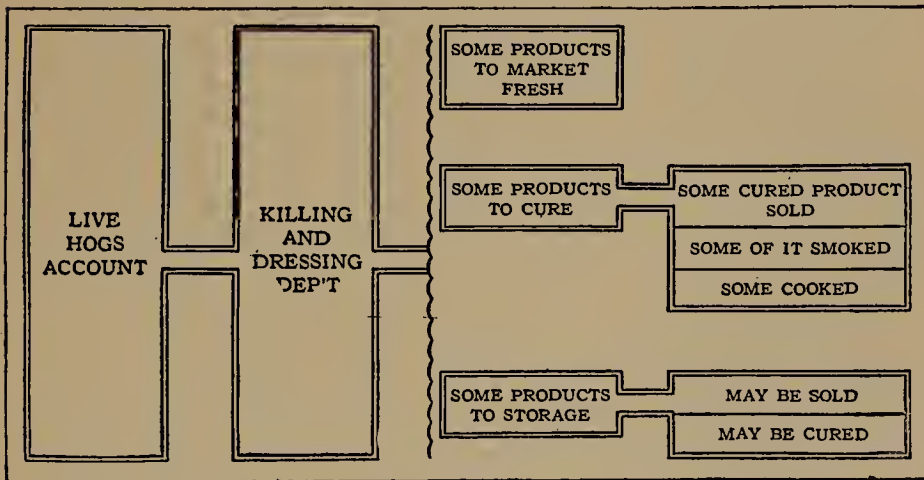


Figure 24. (b) Chart Showing Departmentization of Hog Business

For the hog business, the departmentization will be something along the lines indicated in Figure 24 (b).

Proper Handling of Departments

The present-day packing organization is essentially a group or aggregation of separate industrial activities or competitive businesses. Each department or activity meets the competition of other firms engaged in that particular line of business. There are those which only have a slaughtering business, selling all products fresh. They meet the competition of all slaughterers, including as well local and farm slaughterers. Some

organizations process by-products into further manufactured stages, and in these activities meet the competition of concerns handling packinghouse products, such as rendering concerns, hide dealers, etc. Some concerns cure and smoke pork products, and in this operation meet the competition of firms who do only this class of business. Some plants make sausage and must meet the competition of all sausage makers, whether they do a slaughtering and curing business or not. So the larger organizations, engaging in many of these operations and processes, meet competition of other firms at each of these various stages of manufacturing or processing.

It is necessary, therefore, that each of these separate competitive businesses within the organization be handled, operated, and accounted for, on an independent commercial basis, the same as its competitor is operated and accounted for. That is the only way these larger groups of businesses can be handled or operated. That is the way the organization is built up and the way the business is manned and operated. It is simply an aggregation of separate competitive businesses. This condition means accounting for each department on a commercial basis, charging it for its goods bought at their full value, whether bought from another part of the organization or from the outside; charging it all its factory and general expenses incurred, and selling its product at the full market value, whether it be to the outside or to some other part of the organization for further manufacture.

Meaning of Opportunity Costs

The delivery and receipt of these interorganization sales or transfers at their full value is known as transfers at "opportunity costs." "Opportunity costs" are well recognized in economics, but little considered among accountants. These costs mean simply that any product is worth to a department of an organization what the preceding department had the opportunity to get for it if placed in the outside market.

In this industry, at the close of each process or manufacturing operation, the management has the opportunity or option of either selling the product on the market in that stage or of transferring it to some other department for further processing and manufacturing, the product to be ultimately sold in some other form. For example, oleo oil is a merchantable commodity and may be sold as such or may be transferred to an oleo factory for use in making oleomargarine. Fresh hams and bellies may be sold on the market as such or transferred to a curing department to be cured. Cured hams and bellies may be sold as such as they are merchantable commodities, or may be transferred to the smokehouse and manufactured into smoked hams and bacon.

So at each stage in the many processes there is the option of selling the product in its then present form or of passing it on for further manufacturing operations, to be finally sold in a more processed form. This is one of the peculiar features of the industry. The product in its various stages of manufacture is almost always a finished merchantable commodity and may be disposed of in that form. "Opportunity cost," therefore, is the cost to a department of products received from some preceding operation and represents the value the preceding department could get for such products if they were placed on the market in that form.

The markets for various products are the factors which determine the disposition of products in any of these stages. If the market for the product at any stage is more than could be realized if it was manufactured into some other product, then it is more profitable to sell it in the first stage. If the markets for further manufactured products indicate that such processing would yield a profit over what would be realized by immediate sale, then it is more profitable to carry the processing operations further. The fluctuation of the markets for all of these various products is the factor that stimulates or contracts the processing operations and adjusts the

supply of each kind of the various products to the demand for such.

Elements in Inventories

Each one of these various departments handled on a commercial basis receives a final accounting and a profit or loss is realized in each one. This is entirely in order, for as each succeeding operation is performed on the product, labor and expenses are encountered—investment in buildings, machinery, equipment, inventories, etc., is used. The additional manufacturing operations incur additional costs, use additional investments, and should be expected to yield a price sufficient not only to cover the expenses, but to yield a return on the investment used.

The results of the hog business in total are composed of the results of each one of these various departments or processes taken together. For operating purposes, and the conduct of the business, it is necessary to know how each department stands on a commercial, competitive basis.

Inventories of these various products in the process of manufacture will naturally include an element of unrealized loss or gain. To eliminate this would be impossible, for the reason that these various products are unidentifiable in any of these manufacturing processes. A vat of hams, for instance, may include hams from several lots of hogs bought at different times and at varying prices. A pile of dry salt cuts in the cellar would naturally include cuts made from many lots of hogs bought at different times and at different prices.

It is impossible to follow the products and identify them as they pass through the various operations. Hence it is impossible to allocate any departmental losses or gains. It should be noted, however, that the margin, profit or loss, in the packinghouse operations average a very small percentage of the total value of the products handled, and that as inventories are taken on the same basis at the beginning and end of

a period, the element of anticipated profits or unrealized loss in inventories is quite negligible.

Market Influence on Accounting

Packinghouse operations are conducted between two very sensitive and constantly fluctuating markets—the livestock market on the one hand, where the live animals are purchased, and the product market on the other hand, where beef, pork, and other products are sold. Each of these markets is constantly fluctuating, changing daily or almost hourly, in response to conditions within itself. The general movements of these markets, of course, have to be relative, for livestock is worth what its products will bring in the product market less a margin for the services of manufacturing and distributing. Any individual market, however, is subject primarily to the conditions of supply and demand within itself, for the reason that these are perishable products and have to move into consumptive channels at whatever price will induce the trade to absorb the supply at any time.

Beef, for instance, is not sold in any market for a fixed or figured list price, but for what that product will bring in the market in which it is offered for sale. Retail dealers come to the wholesale houses and inspect the beef offered for sale and make bids. They customarily shop around and take advantage of the best bargains offered. Each individual sale to a retailer is a trade in itself, resulting from bids and askings. This product being perishable, it must be sold within a few hours after it is received at a packinghouse wholesale branch. Necessarily, therefore, it moves at the best prices obtainable under the local conditions of supply and demand.

Live cattle, on the other hand, are customarily marketed by farmers in the established open livestock markets. They are consigned to and offered for sale to packinghouse buyers by commission merchants who act as agents for the producers. The prices for live animals are affected by the prices at which

products are selling and the demand for them, and the quantity of cattle offered on the market.

Fewer cattle coming to market means less beef to be placed on the product market. Less beef at any time in a product market to supply the demand there, tends to raise the selling prices. More cattle coming to the livestock markets means more beef on the product market. A large supply of beef on the product market with steady demand can only be moved at lower prices. And it must be moved. So it is the fluctuation in prices for products and animals that stimulates or contracts the amounts coming to such markets. The trends of prices in the product markets reflect back to the livestock market. Price changes in the livestock market stimulate or hold back shipments by farmers. Naturally they attempt to place their stock on the most advantageous market. When prices are good, shipments coming in are stimulated. When a surplus appears and prices are depressed, shipments are naturally held back.

Costs Do Not Settle Selling Price

Fluctuation in prices determined in open competitive markets is the only agency which adjusts the production of goods to the demand for them. It is the desires of the consuming public, and the prices they are willing to pay for goods and service, that lead to the expenditure of human effort necessary to produce such goods. The forces controlling prices in markets between which the packing industry is conducted do not differ fundamentally from the forces controlling markets for any competitive industry. The significant feature is the sensitiveness of these markets for livestock and packinghouse products, which is due to the perishable character of the products, that necessitates prompt movement into channels of consumption. In this connection special reference should be made to an article appearing in the *Journal of Political Economy*, Volume XXIX, No. 8, October, 1921, entitled

"Unit Costs as a Guiding Factor in Buying Operations," by George E. Putnam. This article emphasizes in a very clear and able manner the fact that unit costs do not determine selling prices. It is the demand for goods that leads to the supply, and the present and prospective consumers' prices that lead to producers' prices.

The fact that the markets for livestock and packinghouse products are unusually sensitive means that those controlling such packinghouse operations must be promptly and well supplied with market information and cost statistics. They must have at hand at all times the most recent information as to the markets and costs of live animals; they must know what the products are selling for, wherever such products are marketed; and must have up-to-the-moment and reliable information as to costs. These conditions impose on the accounting forces of packinghouse organizations more exacting requirements than are commonly met in other industries. In addition, there are the peculiar cost and accounting problems arising out of the character of the operations which have to be considered. Summing up the whole matter, the packing industry probably places greater responsibility on its accounting and statistical forces than most industries, and the information and statistics prepared must be dependable and supplied promptly. Old cost figures and statistics may afford consolation but they do little good for the current business.

CHAPTER XIX

EXTENSION OF LIVESTOCK PRODUCTION— 1880-1922¹

Cattle Center in West

In 1880, 78 per cent of the population of the United States was east, and more than half (56 per cent) of the cattle west of the Mississippi River. Today, while more than two-thirds of the population is in the states east of the Mississippi, more than two-thirds of the cattle are west of the Mississippi. In comparing the manufacturing and non-manufacturing sections of the United States in 1910, it was seen that more than one-half of the population was found in less than one-seventh of the country, namely, the states east of the Mississippi and north of the Ohio and Potomac rivers. This portion of the United States produces more than three-quarters of the manufactured products, pays more than three-fifths of all salaries and wages, and contains more than two-thirds of the assessed value of all real and personal property. It is, therefore, the great consuming area. Yet in the region east of Chicago there is less than one-eighth of the beef cattle and less than one-fifth of all the cattle in the country.²

It is not possible to locate the center of beef production in 1840, since the census of that date failed to distinguish between "milk" and "other" cattle, but in 1850 the center of beef cattle production was located in the approximate vicinity of Richmond, Kentucky, to the south of Lexington. Its location there makes it probable that the center of beef production

¹ In this place it is not possible or necessary to treat of the technical phases of livestock production.

² Mumford, H. W., and Hall, Louis D. "Beef Production in the United States," *The National Provisioner* (Jan. 17, 1914), Vol. L, No. 3

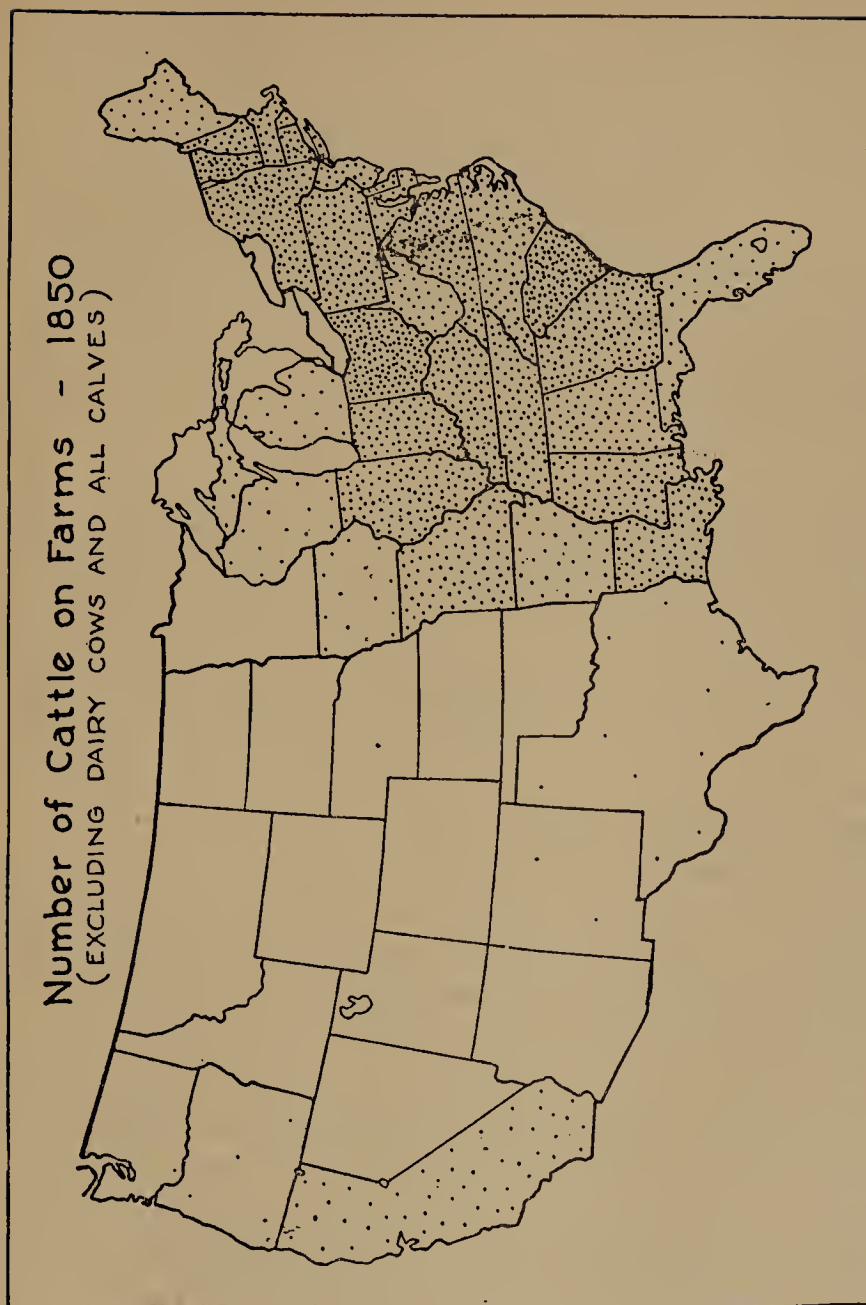


Figure 25. (a) Map Showing Number of Cattle on Farms, 1850

in 1840 was not far from the center of hog production at that time, although it may have been somewhat to the east, over the line in West Virginia.³

By 1860 a great change had taken place. The center had moved some 250 miles westward to Lowes, Kentucky, a short distance to the southwest of Paducah. The rate of movement was directly due to the rapid settlement of the West, while the direction of movement depended on the great increase in "other cattle" in the state of Texas from 112,000 to approximately 3,000,000 head.

Civil War Effects

The Civil War altered the direction of displacement for the center of beef cattle production by about the same degree to the northwest that it had deviated to the southwest during the previous decade. The confederate states, exclusive of Texas, lost approximately 1,500,000 head, while the Corn Belt and Northwest showed the impressive gain of about 2,000,000 head. The center was in the vicinity of Bixby, Missouri, some 60 miles southeast of Rolla.

By 1880 the center had reached Vienna, Missouri, about 35 miles southeast of Jefferson City. This relatively small displacement was due in part to the recovery of the South, which tended to retard any northward or westward movement, and in part to the lowered rate of increase in the Northwest and Corn Belt. In 1890 the center was at Creighton, about 60 miles southeast of Kansas City, Missouri. The displacement was almost due west during this decade, as a result of the balanced increase in cattle production in both the northwest and southwest range, and the decreased production of beef cattle further east.

The 1900 census saw a westward move, the center being located a few miles northeast of Waverly, Kansas, and about

³ This is based on a very interesting monthly letter to animal husbandmen, by E. N. Wentworth, Director, Armour's Livestock Bureau, November, 1921.

30 miles to the southwest of Ottawa. A slight southerly deviation thus occurred from the almost due west line followed in the previous decade, due to the relatively better conditions in the southwest range as compared to the northwest range, and also to the further recovery of the Southeast.

The displacement between 1900 and 1910 was relatively slight, being no greater than that which occurred between 1870 and 1880. The direction was almost due northwest, and the location was in the vicinity of Eskridge, about 40 miles southwest of Topeka. This northward shift was dependent on the great decrease in Texas and Oklahoma, some 4,000,000 head being lost in these two states alone. By 1920 the center of production had passed to the west of the geographic center of the country and was in the vicinity of Ellsworth, Kansas. Part of this westward shift was dependent on the unparalleled decreases in all of the New England, Middle Atlantic, South Atlantic, and eastern Corn Belt states.

Cattle Increase by Decades

The number of cattle increased rapidly during each decade to 1900. Since the beginning of this century a relative decline has set in, for although the cattle of the United States have increased numerically by decades up to the present, their number has not kept up with the increase in population during the last 30 years. In 1890, the number of cattle equalled 80 per cent of the population, but in 1910 it was at most no higher than 75 per cent, while the population had grown 21 per cent. There was a decided increase in cattle in many states from 1870 to 1890. This was the period of the range, and the cattle "kings" and "barons" were at the height of their prosperity. During the next decade further increases were noted in Texas, Oklahoma, Colorado, and the Dakotas, while the remaining range states showed a decrease or remained practically unchanged.

The most notable feature of the decade 1880-1890 was

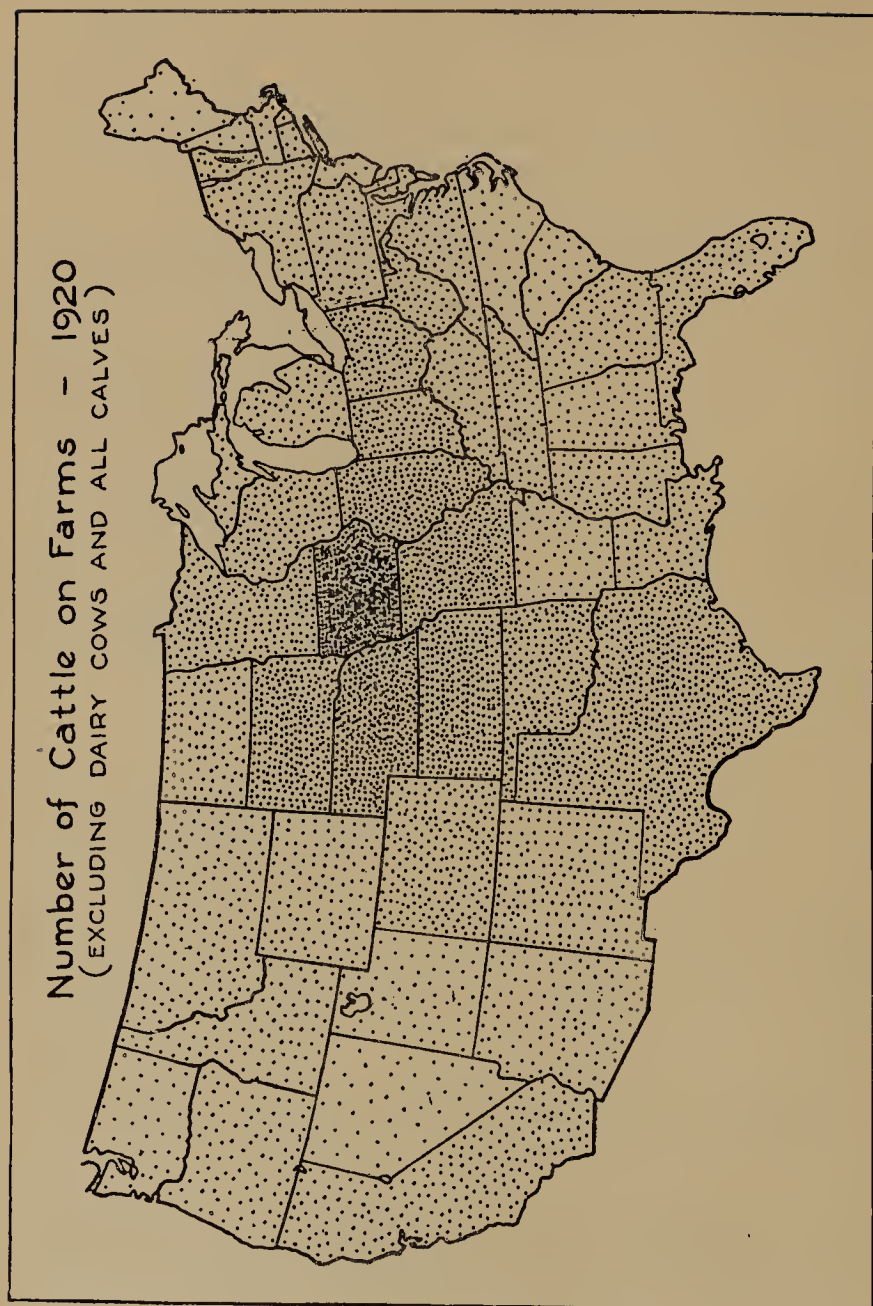


Figure 25 (b) Map Showing Number of Cattle on Farms, 1920

the improvement of livestock through importation. The Aberdeen or Polled Angus, introduced about 1870, showed themselves adapted to the climate and conditions of the north central states. There was in this period a generous rivalry between herdsmen regarding the superiority of Shorthorns, Herefords, and Polled Angus, all of which breeds were of great value to the United States. They comprise practically all the pure-blooded cattle in the country for breeding and grading up native cattle for beef. From 1900 to 1910 there was a decrease in Texas and smaller declines in New Mexico, Arizona, and Montana, all other western states, especially Wyoming and the Dakotas, showing increases. These decreases, at first in the northern range states and then in the southern, were due in large measure to the passing of the 4-year-old steer.

Recent Trends

During the period since 1907 the following summary indicates the trend:

1. Beginning with the near panic at the close of 1907, there was a tremendous demand for cheap beef.
2. An immense sacrifice of cows and heifers to satisfy the great demand for cheap beef followed, leaving the whole country seriously short of breeding stock.
3. The depletion of the nation's stock of female cattle forced packers and slaughterers to turn to the lighter and cheaper steers to meet the continued heavy demands for cheap beef. This brought them into direct and constant competition with feeder buyers, raised the general level of prices for the latter, and caused a general scarcity of cattle for the feed lots and a consequent higher cost of fat cattle.
4. A series of adverse causes, including financial stringency, disastrous periods of drought, fear of tariff removal consequences, foot and mouth disease, three deficient corn crops in succession, war, two terribly severe winters, three

years of the greatest cattle slaughter ever known, and scarcity and high cost of feed and farm labor, together with general distrust concerning future cattle values, combined to prevent recovery from the general shortage of either breeding stock or young cattle suitable for the feed lots. This was especially true with the population growing at the usual rate, with labor fully employed at very high wages and disposed to purchase liberally of beef whenever retail prices were brought within reasonable distance of the prices paid for live cattle.⁴

New Cattle Sources

New sources of supply, however, are being developed and the cattle production on old ranges is being increased. It is generally conceded that the carrying capacity of the remaining areas of public range is at least 25 per cent less than it was originally, the result of grazing stock at improper seasons and of overstocking. It is also a fact that the productiveness of many privately owned ranges, both fenced and unfenced, has been reduced through faulty management.

The United States Forest Service is at work on a system of range management and improvement for large grazing units, which will build up the depleted areas and insure the maintenance of the whole range in good condition. The problem is: (1) finding the system of management that will best bring about natural reseeding of the existing forage plants; (2) finding new plants suitable for seeding on the ranges of the southwest; (3) determining the number and distribution of stock watering places necessary for efficient use of the range, taking into account the cost of construction and returns expected; and (4) determining the carrying capacity of the range as a means of preventing its being overstocked.⁵

⁴ "Present and Future Cattle Supply," by M. F. Horine, Statistician, Union Stock Yards and Transit Company, Chicago. Mr. Horine says: "I cannot accept the cattle estimates of the Department of Agriculture according to which there were 11,000,000 head or 20% more cattle in the United States on January 1, 1919, than at the corresponding time in 1914. These figures are open to serious question and do not purport to be more than an estimate."

⁵ U. S. Department of Agriculture Bulletin No. 588, "Increased Cattle Production in Southwestern Ranges," by James T. Jardine, Inspector of Grazing, and L. C. Hurtt, Grazing Examiner (Nov. 15, 1917).

The cattle feeding business has changed greatly during recent years.⁶ Formerly, steers from 4 to 6 years of age were fed in large numbers upon commercial foods at yards near granaries or mills, or on large farms where only the roughage was grown, and the cattle were kept on full feed for six months or longer. This method became too expensive, so feeding is now conducted upon farms as a means of marketing farm products by converting them into beef, while the manure produced is utilized as a by-product for maintaining fertility. At the present time in the corn belt cattle are usually fed in small herds of one to four carloads, and are marketed at 18 months to 3 years of age.

Several factors have united in causing these changes; for instance, a gradual increase in the value of farm products and the cost of farming and feeding operations, and the rapid increase in tenant farming in many cattle feeding sections. These tend to discourage cattle feeding.

Feeder Cattle Sources

There have been two main sources of supply for feeder cattle—those grown in the corn belt, commonly called “natives,” and those coming from the western ranges. The native cattle were usually grown on the rougher farms of the Corn Belt, or on the small farms, where dual purpose cows were kept. They were usually sold to local feeders as yearlings or 2-year-olds. Some feeders desiring animals of extra good quality raised their own feeders. A new source, however, is now being developed in the South. Growing good beef cattle is a new industry in the South, but one that has developed so rapidly in the last few years that it is now among the leading phases of southern agriculture.⁷ Fifteen years ago, when

⁶ U. S. Department of Agriculture Bulletin No. 588, “Economical Cattle Feeding in the Corn Belt,” by J. S. Cotton and W. F. Ward (June 24, 1914). See also U. S. Department of Agriculture Report No. 111 (1916), “Meat Situation in the United States,” Pt. III, “Methods and Cost of Growing Beef Cattle in the Corn Belt States,” by J. S. Cotton, Moulton O. Cooper, W. F. Ward, and S. H. Ray.

⁷ Growth of the Beef-Cattle Industry in the South, Yearbook, Department of Agriculture, 1917, p. 749.

cotton was the principal crop, very little attention was given to the improvement of beef-cattle herds, although the actual number of these cattle was greater than at present.

There was a gradual decrease in all beef animals in the cotton belt from 1900 to 1914, after which there was a gradual increase to 1917. However, greater improvement has been made in quality than in numbers. When cotton reigned supreme, farmers kept their steers until they were 5, 6, and even 8 years old before marketing them. This practice gradually changed as interest in beef-cattle raising became more intense, farmers selling their cattle at an earlier age from year to year until now very few are kept beyond three years. At the same time more attention has been given to marketing, and as a result a minimum number of cattle are kept, other than the breeding stock.

The Southern States

The year 1909 really marked the beginning of the beef-cattle business on a practicable basis in the South. Before the Civil War southern slaveholders took a great deal of pride in having a few well-bred cattle of the Devon and Shorthorn breeds on their plantations, and the blood of these cattle is still found in the native southern herds in a few rich-red, big-framed cows.

In the states of Louisiana, Arkansas, Mississippi, Alabama, Florida, Georgia, and South Carolina, especially where cotton was the principal crop, little thought was given to intelligent selection and breeding of beef cattle. The use of scrub bulls was so general and inbreeding so intense that the native mongrel cattle, with very few exceptions, were very inferior, and no improvement was made until the appearance of the cotton boll weevil, which forced the farmers into the cattle business. Then, of necessity, farmers began to look for some new industry that would fit into their farm operations and take up the lost motion.

It was then that the South's mild climate, good carrying capacity of pasture for 8 or 9 months a year, heavy yields of the different legumes, large yield of by-products from cottonseed, and large yield of grain most forcefully suggested cattle raising.

Hogs and Their Spread

Hogs have always been the mainstay of American meat production. In the middle of the eighteenth century, the colonies took advantage of the wars in which the British Empire was involved to wrest from her a share of the West Indian pork and provision trade, and the business thus established has persisted in increasing dimensions until the present day.

America is the great pork consuming nation. In 1900 the per capita consumption of pork and lard was 89.2 pounds; in 1909, 80.4 pounds; in 1916, 90.9 pounds; in 1917, 70.1 pounds; in 1918, 87.3 pounds; in 1919, 83.0 pounds; and in 1920, 83.2 pounds. Our closest rival is Germany, which in the period of 1904-1913 consumed an average of 69 pounds per capita. Great Britain, on the other hand, consumed only 34.5 pounds; France only 27 pounds; and Canada only 55.5 pounds. Possibly a more important measure of the rôle of pork in the diet is the percentage of pork in the total meat consumption. Over a 10-year period previous to the war, 61 per cent of the German meat diet was pork; 45.1 per cent of the Canadian diet; 41.8 per cent of the United States diet; 34.2 per cent of the French diet; and 29.2 per cent of the British diet.

Detailed data on the hog industry were not available until the Sixth Census, in 1840. At that time New York, Ohio, Virginia, Kentucky, and Tennessee were the principal hog states, all of them having in the neighborhood of two million or more. Tennessee was the leading state with 2,926,607 head. The center of hog production was in eastern Kentucky as shown in Figure 2a (page 50). In 1850 the center of

American production had shifted about 100 miles west and a few miles south. This was due to tremendous decreases in the New England and North Atlantic states as far west as Ohio, and the rapid increase in Indiana, Illinois, and Missouri. Tennessee was still the leading state with 3,104,800 head, and the southern displacement was caused by the rise of the Carolinas and especially of Georgia and Alabama.

North Gains and South Loses

The Eighth Census in 1860 was extremely significant. The center of hog production had moved some 80 miles southwest, due to the great increase in Texas and California, and the continued decrease in the manufacturing states of the Northeast. The South had already begun the diminution which in after years was attributed to the war. Tennessee dropped to 2,347,321 hogs in this decade, while Indiana became the premier swine state with 3,099,110 head. Kentucky decreased a half-million and Alabama, Georgia, the Carolinas, and Virginia another half-million total. The Corn Belt made liberal gains in this decade, Missouri and Iowa increasing over 600,000 head, while Indiana gained 800,000, and Illinois nearly 600,000.

The war made possible the almost directly northward displacement of the center of production by 1870. Ohio and Indiana lost a total of 1,700,000 hogs, while Illinois, Michigan, and Wisconsin picked up about 400,000. Iowa equaled the total of these four states, while Minnesota for the first time became a factor in influencing the hog trade. Illinois was the banner hog state during this census, while California and Texas showed decreases. The northeastern states continued to decline, while the southern states east of the Mississippi and south of West Virginia and Kentucky lost about 6,000,000 head. Not all of this was due to the war, as was noted in the previous paragraph. Much of this decline was due to the fact that the southern states were consistently over-

stocked with hogs in relation to the population, and had no means of broadening their outlet for pork products.

Iowa Takes the Lead

The westward shift from 1870 to 1880, and from 1880 to 1890, is directly traceable to the rise of Iowa, Missouri, Nebraska, and Kansas, although the Pacific Coast had begun to pull on the center. Iowa assumed the lead in hogs in 1880 and has never since yielded it. The eastward recession in 1900 was due to the recovery of the southeastern states, as was the southern shift from 1910 to 1920. The westward movement from 1900 to 1910 was a result of the settling of the West and Northwest, the inroads of the farmer into the old range country.

Future moves are uncertain. It would not be surprising to see a displacement eastward again, since many believe the present business disturbance must recover in an easterly to westerly direction. However, much depends on the rate of recovery, on the influence of the future cotton market as affecting the type of southern agriculture, and on the diversification of the West.

Sheep Distribution

In 1910 sheep were fairly evenly distributed throughout the western half of the United States, with concentration points in southwestern Idaho, central Colorado, and throughout Wyoming.⁸ In the East they are rather thinly scattered, but there is a decided center in southeastern and central Ohio and in south central Michigan. There is a notably thin distribution of sheep in the tier of states along the 100th meridian from Texas to North Dakota and they are relatively scarce in the cotton belt. In the West the production of sheep is managed in an entirely different way than in the East. In the West sheep are

⁸ This is from Federal Trade Commission Report on The Meat Packing Industry, Pt. I, p. 400.

grazed on open ranges for the most part by large owners who specialize in the business. In the East a flock of sheep is frequently found on farms where there is diversified agriculture. Sheep are often used to pasture the rougher and less accessible portions of farms. The notable concentration of sheep production in Ohio is an historical development.

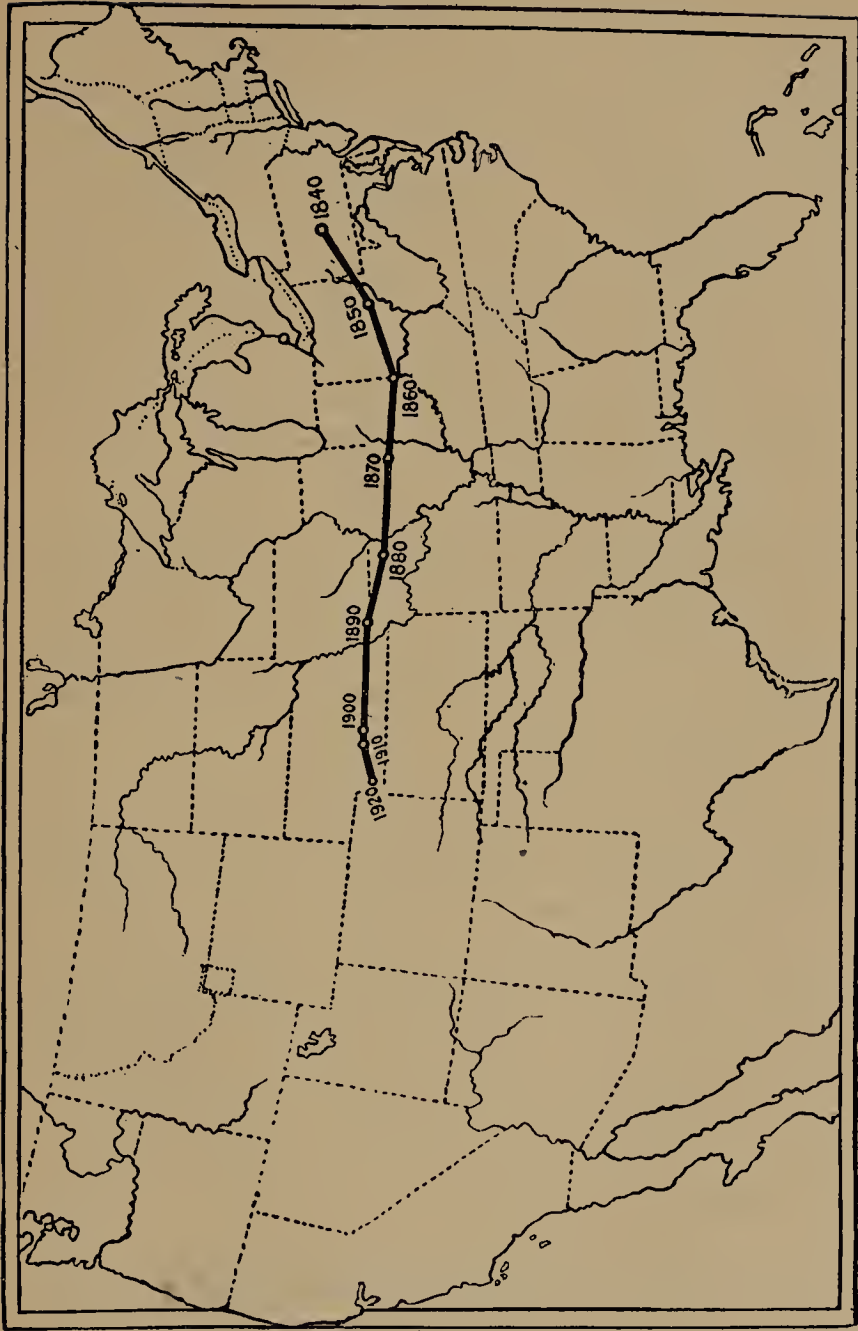
The number of sheep in the United States has been steadily declining, relatively to population. In 1880 it was 42.1 millions, in 1890, 40.8 millions, in 1900, 41.8 millions, in 1910, 57.2 millions, and in 1920, 48.6 millions.⁹ This decline is noticeable in the western sections of the country. The general trend of the distribution of sheep, as with cattle and hogs, has been westward.

Trend of Sheep Centers

More noticeably than in the case of swine and beef cattle the displacement of the center of sheep production has been almost directly westward. In 1840 the center was 30 miles north of Altoona, Pennsylvania, and New York was the leading sheep state with over one-fourth of the total number of sheep in the United States. Ohio was second; Pennsylvania, third; and Vermont, fourth.

The year 1850 saw a marked decrease in the total number of sheep in New York and a corresponding increase in the number in Ohio. The center of production moved across the Pennsylvania border to the vicinity of Beverly, Ohio, about 35 miles north of Parkersburg, West Virginia. Ohio assumed the lead as a sheep producing state and did not yield it until the census of 1900. During the next decade the center of production completely crossed the state to the Indiana-Ohio border line. The center was in the vicinity of Harrison, Ohio, about 20 miles to the north of Covington, Kentucky. New York was still the second state in sheep population, but her position was lost early in the following decade to California.

⁹ Yearbook of Figures, *Chicago Daily Drovers' Journal* (1920), p. 94.



Courtesy Armour's Livestock Bureau

Figure 26. Map Showing Change in Center of Sheep Production, 1840-1920

In 1870 the center was located about 5 miles south of Westfield, Illinois, and about 50 miles to the southwest of Terre Haute, Indiana. After Ohio, the leading states in sheep production were California, New York, Michigan, Indiana, and Illinois respectively. The census of 1880 placed the center of sheep production near Edina, Missouri, about 50 miles southwest of Keokuk, Iowa. In this census California reached her premier position as a sheep state, having 4,152,349 head to Ohio's 4,902,486 head. Texas for the first time became a determining factor in sheep production and ranked third with 2,411,633 head. Michigan was again fourth, while New Mexico went into fifth position.

Iowa claimed the center of production in 1890, although she herself ranked only nineteenth. The point was located about 5 miles south of Clarinda and about 70 miles north and slightly west of St. Joseph, Missouri. Texas passed California and stood next to Ohio, with Michigan still fourth and a newcomer, Montana, fifth.

In 1900 Ohio was for the first time surpassed as a sheep producing state. Montana ranked first with 6,170,483 head; Wyoming, second with 5,009,613 head; and New Mexico, third, with 4,899,487 head. The center was located in the vicinity of Pleasanton, Nebraska, about 20 miles to the north of Kearney. 1900 was the banner year for sheep production in the United States, as the total was 61,503,713 head, approximately a 70 per cent increase over 1890, which showed 35,737,364 head, the largest production up to that time.

Sheep Decrease Since 1900

Since 1900 the sheep population has decreased. In 1910 it was about 9,000,000 head less, but the decrease was relatively proportionate all over the country, since the displacement of the center was only about 20 miles due west of its 1900 location. In 1910 it was a few miles east of Sumner, Nebraska.

The sheep losses registered by the 1920 census are familiar to many. Approximately two-thirds as many sheep were listed in 1920 as in 1910 and the decrease was much greater to the east of the Mississippi River than to the west. Texas became the leading sheep state, although her total was only 2,552,412 head. California ranked second; Idaho, third; Ohio, fourth; Montana, fifth; and Oregon, sixth. Eastern decreases were very marked, New York showing only a few over a half-million, and approximately one-ninth of the number she possessed in 1840. The center of production moved to the southwest corner of Nebraska in the neighborhood of Imperial.

The decadence of certain states as sheep producers is very marked. Reference has already been made to New York, but other states have shown even more impressive decreases. Vermont in 1920 possessed only one-twenty-sixth of her sheep population of 1840; New Hampshire, one-twenty-second; and Connecticut, one-fortieth. Ohio today shows about three-sevenths of the number of sheep she possessed at her high point in 1870, a decrease of 2,800,000; Michigan shows less than half of her best record in 1900; Wisconsin possesses only a little over a quarter of the 1,675,000 she had in 1900; while the Atlantic Coast states, the Gulf states, and the Bluegrass district are all greatly reduced. The range droughts have been calamitous in Montana, Idaho, Wyoming, New Mexico, Arizona, Utah, and Nevada, the total reduction between 1910 and 1920 being approximately 10,000,000 head. Curiously enough some states have been very constant in their sheep population for the last three censuses, as, for example, Iowa and California, while Kansas has actually registered an increase.

Mutton Consumption and Business

Like beef consumption, mutton consumption is quite intimately related to the financial and business conditions of the country. Pork consumption, on the other hand, is much more stable. During the last 14 years the average pork consumption

was 71.2 pounds per capita, its average annual deviation was 4.01 pounds, and the percentage of the deviation in terms of the average was 5.63 per cent. The corresponding figures for beef were 66.2 pounds per capita consumption; 7.4 pounds, average annual deviation; and 11.17 per cent, annual deviation in terms of the average. Mutton is almost exactly the same, showing an 11.38 per cent deviation in terms of the average, based on an average consumption of 6.5 pounds, and an annual deviation of .74 pounds. Veal is still more variable, since its consumption per capita averages 6.6 pounds, its annual deviation 1.04 pounds, and its per cent deviation in terms of the average, 15.75 per cent.

Great Britain leads all countries in mutton consumption, its average for about 18 years varying from 25 to 27 pounds, as against 55 to 60 pounds of beef and veal combined, and 31 to 38 pounds of pork. Detailed figures are not available on mutton consumption in Australia, New Zealand, and Argentina, but they presumably approach Great Britain, although they do not excel her. Canada consumes about 9 pounds of lamb to 61 pounds of beef and 67 pounds of pork and lard. France consumes about 9 pounds of mutton and lamb to 43 pounds of beef and veal and to 27 pounds of pork. Germany consumes only from 1.9 to 2.5 pounds of mutton and lamb as against 39 to 45 pounds of beef and veal and 65 to 73 pounds of pork and lard. Since the United States consumes about 6.5 pounds of mutton and lamb to 72.8 pounds of beef and veal and 71.2 pounds of pork, it will be seen that she occupies a position below Canada and France, but above Germany in her consumption of mutton and lamb as a part of her meat diet.

What this indicates in the future is difficult to say, as the wool situation in the United States has always overshadowed the mutton situation. Slightly better prospects in both the wool and meat trade from a relative standpoint would suggest a recovery of the drought-stricken areas of the Northwest and

an increase once more in their flocks. This will probably result in a displacement of the center of sheep production toward the northwest.

The last sheep census shows a decline in ten years of 18,000,000, a drop from 52,000,000 to 34,000,000. In the first nine months of 1921, 17 per cent more sheep were slaughtered than during the corresponding period in 1920. Most of the ewe lambs of 1919 and 1920 were killed, and those two crops cannot be replaced. According to John Clay, the veteran stockman, this situation has worked great harm to the country.

Sheep and Wool Slump

For a time the slump in wool and the decline in mutton reduced the value of the ewe below her intrinsic worth. In consequence the loans on many western flocks were greater than their worth. The bankers were not sympathetic to the sheep business. This policy, however, failed to bring the business out of the woods. Different treatment was necessary, careful reinforcing, building up, and handling. It is fortunate that at present every effort is being made, according to well-known authorities, to counteract the errors of the last two years in regard to credit.

The decline of the sheep industry in the West, outside the forcing of lambs to market in 1919 and 1920, came from the contraction of the range. The dry farmer and the small ranchman forced out the cowman first and then the sheepman. Finally about 1910, there was a vast increase of land seekers, and one of two things had to happen—the flocks had to go or land had to be bought. Many liquidated and left, while the sheepman who had invested too largely was in a bad way.

The Future

The change, however, has now begun, and things are running in favor of the sheepman once more. Due to the fall

in wheat values, until it is hard to make a living, the retreat of the dry farmer has set in. The sheepman is able to acquire land cheap for grazing, with the prospect of 50 per cent wool and \$8 and \$10 lambs. A new era is opening up.

In taking advantage of this situation, however, this advice of a veteran is worth hearing: "Prosperity will come when the flockmaster gets back to the canvas-covered wagon. For his place is near his sheep with the careful looking to accounts and markets, and no straining of credit."

CHAPTER XX

WESTWARD EXTENSION OF MEAT PACKING

Packing Follows Livestock

After consideration of the extension of livestock production in recent decades it is well at this point to trace broadly the spread of the packing industry over the country, a process that made possible the position it now has as the largest industry in value of product in the United States. Following the new supplies of livestock westward and extending with the rise of the dressed beef trade, the packing industry is found beginning operations at St. Louis in 1870, at Kansas City in the seventies, in Omaha, Nebraska, a little later in the same period, and at St. Joseph, Missouri. Thus, while Chicago remained the greatest cattle market and the packing plants there were the largest, there were growing up other great plants at points along an advancing frontier of 1,000 miles north and south. The movement of the packing industry was thus first toward the west while in recent years it has been developing in the South. Attention must now be directed to the progress westward.

By 1877 there were three slaughtering establishments on a large scale at the National Stockyards, East St. Louis, but though St. Louis has continued to be a great center, it was to be outdistanced by Kansas City and Omaha which were nearer the cattle source.¹ This can be seen by the figures of receipts and shipments of livestock, for example in the Yearbook of the *Price Current-Grain Reporter*.

¹ Vest Report (pp. 56-57). Testimony of John M. Osborn, Division Freight Agent of the Wabash Railroad.

Packinghouses were established early at Kansas City by the promise of an abundant supply of hogs and the good railroad facilities for receiving them from the farms and distributing the manufactured product. The pioneer packers in Kansas City also saw a good chance for success in yards at railroad terminals and centers which were at the same time on a competitive freight basis with Chicago and close to producing areas.² Their coming furnished a ready market for all receipts and at satisfactory prices, and a new stimulus was given to the hog industry throughout the new West and the territory tributary to Kansas City, which is one of the greatest of hog regions.³ The building of a livestock market at Kansas City attracted the attention of meat manufacturers and men with means were found to finance packing establishments. While at first attention was given to pork packing the nearness of the range country made the city well adapted to the dressed meat business also. The early packers at this point did good work, but gave way in a few years to others. For the pioneers were possessed of but moderate resources and, competition being keen, they gradually gave place to larger and more powerful concerns.

Early Kansas City Packing

In 1869 Dr. F. B. Nofsinger of Indianapolis joined an earlier packing firm of Pattersons, which later became Nofsinger and Company, and was the first concern to ship fresh beef in refrigerator cars to the East, out of which it developed an important business.⁴ A year later the firm of Plankinton and Armour leased the old Nofsinger house and in 1871 built their own establishment. Their business was packing mess beef, putting the product into barrels, and loading it on steam-

² The *Morris Standard* (house organ of Morris and Company), article "Developing the Packing Business—the Rise of Kansas City and East St. Louis," quoted in *The National Provisioner* (Apr. 19, 1913), Vol. XLVIII, No. 16.

³ Powell, Cuthbert, *Twenty Years of Kansas City's Livestock Trade and Traders*, p. 47; and McCoy, J. G., *Sketches of the Cattle Trade*, Chap. XV, "Packing at Kansas City, 1874," p. 30.

⁴ U. S. Department of Agriculture, *First Annual Report Bureau of Animal Industry* (1884), pp. 246-248, article by Edw. W. Perry.

boats plying on the nearby river. The first year they packed 14,000 cattle and 30,000 hogs and in 1873 felt justified in building an ice house and chill room, doubling their capacity.⁵ In the next decade the pork packing industry of Kansas City increased from 180,357 hogs packed in 1877 to 1,889,054 in 1887, a gain of 891 per cent.

As Kansas City began to attract attention as a packing point new firms were drawn there. Beginning with 1880 the Anglo-American Packing Company erected a plant near the mouth of the Kaw and killed about 350,000 hogs the first year. Swift and Company opened a branch plant in Kansas City in 1887, and in the same year Kingan and Company of Indianapolis and Belfast, Ireland, one of the oldest and wealthiest packing firms in the country, opened a branch at Kansas City. This company gave special attention to English cuts and an extensive business was done with Ireland, the United Kingdom, Germany, and France, and even India and Australia. In 1891 they began to give attention to the killing of cattle as well as hogs, shipping in their own cars their dressed beef to their own branch houses over the South and East.

The success of these houses soon attracted the attention of other packers, including the Kansas City Packing Company, later the Phoenix Packing Company, which finally, in January, 1893, was bought by Schwarzchild and Sulzberger, cattle shippers and beef exporters of New York, who realized that just as the western packers had extended their organizations east, so they must extend their operations into the West to tap the growing central livestock markets. Following the smaller packers who had been establishing themselves, other larger packing companies in the United States which had no plant here, the Cudahys, Nelson Morris and Hammond, had to consider whether they could much longer remain out of the second largest livestock market in the world, and out of trade that can be covered only from Kansas City. By about the

⁵ Powell, C., *op. cit.*, p. 89.

beginning of the century Morris and Company and the Cudahy Packing Company did build plants in Kansas City.

Wichita and St. Joseph

By the early years of the twentieth century several packing plants had been established at another Kansas point, namely, Wichita. One of the biggest was the plant of the Jacob Dold Packing Company which at the time it was built (1902) was said to be one of the greatest west of the Mississippi.⁶

As an example of the packing industry's extension westward toward the source of livestock supply, St. Joseph, Missouri, is of importance, though of later development than some others. There had long been local packinghouses there. The first one, founded by David Pinger in 1853, was followed a few years later by Henry Krug and Company, the Missouri Valley Packing Company, Horc and Brother, S. S. Connett and Brother, Fowler Brothers and Smith, Farlow and Company, all of whom were pork packers, for this was before the days of dressed beef.⁷ Finally, in December, 1887, the stockyards of St. Joseph were opened. Several small packing concerns, such as Viles and Robbins, the Anchor Packing Company, the St. Joseph Packing Company, and the John Moran Packing Company established themselves in St. Joseph, though most of them had to discontinue business and sold out to others. Among the reasons for this were lack of capital and the fact that St. Joseph was not as yet a big enough livestock center for an extended business. For this had to be developed. Thus in the middle nineties the packing industry was languishing in St. Joseph.⁸ Then it was that the plan was worked out for the establishment of an up-to-date stockyards by John Donovan, already general manager of the yards there for G. F. Swift and Nelson Morris.⁹ The former was the first to see that St.

⁶ *The National Provisioner* (Feb. 9, 1901), Vol. XXIV, No. 6; *Ibid.* (July 5, 1902), Vol. XXVII, No. 1.

⁷ *Ibid.* (May 14, 1898), Vol. XVIII, No. 20.

⁸ *Ibid.* (Aug. 3, 1895), Vol. XII, No. 5.

⁹ Winans, *Evolution of a Vast Industry*.

Joseph had the geographical location and that it had the country to draw from to make it a great packing center.

Donovan succeeded in interesting G. F. Swift, who looked over the situation, examining the qualities of soil, the transportation facilities, the type of farming population, and other matters. As a result, in July, 1896, the stockyards company was reorganized under the name of the St. Joseph Stockyards Company, and in January, 1897, Swift and Company became owners of the majority of the stock of the stockyards company. With the erection of a plant covering 19 acres by Swift and Company and another by Nelson Morris and Company, which bought a large block of the stockyard company stock, the rise of St. Joseph as a packing center was assured. "The advent of the packing industry, on a big scale meant the transformation of a city of sluggish life, dependent solely on its advantages as a wholesaling mercantile center, into a stirring, progressive city with a fast increasing population and vitality."

Omaha's Packing Beginnings

At Omaha, Nebraska, stockyards on a small scale were early established.¹⁰ These were known as the "Bridge Yards" and the "Upper Yards." At first they were sufficient to handle the few cattle received, but in a short time the increase in the shipments of livestock to the city made necessary plans for more extensive yards. Thus as early as 1877 the livestock committee of the recently organized Omaha Board of Trade reported that it had been "impressed with the very generally expressed views of not only the business men of Omaha, but of the stock raisers and shippers themselves, north, south and west, of the importance and necessity of erecting and maintaining extensive stockyards and pickling and slaughtering houses in Omaha."

Omaha had built up what was thought at the beginning of 1879, to be a large business in pork packing. The leading

¹⁰ *The National Provisioner* (Feb. 4, 1893), Vol. VII, No. 5.

packers were James E. Boyd, David Cook, and J. Phipps Roe. As time went on, Boyd became the most important packer, killing some 60,000 hogs a year. His chief competitors in the late seventies and early eighties were Harris and Fisher, and Joseph F. Sheely and Company. The Harris and Fisher plant employed from 20 to 50 men at an average wage of \$1.50 to \$3 a day (1878). It had a capacity of 400 cattle and 300 to 400 hogs a day. The firm packed some mess pork, but had more of a specialty in dry smoked and salt meats, beef curing, and canning.

The packing business in Omaha itself, however, was finally almost abandoned, there having been established such a competition nearby that it was futile to continue the business inside the boundary lines. In 1883 a practical turn was taken when men, most of whom were citizens of Omaha, evolved a plan for the laying out of a town, at or surrounding their industries, each to be an enterprise by itself, a distinct organization controlling its own affairs. These men had studied for themselves the movement of livestock in the West and they reasoned in this way:

Omaha as a Livestock Center

Omaha now is to Nebraska and the country beyond what Chicago was to Illinois and the great west when that city was the present size of Omaha. It is a natural law of trade that livestock will seek the nearest market, other things being equal. This will in a few years render Omaha one of the largest livestock centers in the United States.

A site was soon selected for the plant and a town. Simultaneously, two enterprising men had without each other's knowledge looked upon the open country south of Omaha and in 1884 there were built the stockyards and packinghouses and it was called South Omaha.

For a time after starting South Omaha there was only one packing firm in the place and unusual inducements had to be

offered to others to locate there. However, the newly formed Cudahy Packing Company whose founder, Michael Cudahy, had long been one of P. D. Armour's right-hand men, made Omaha its headquarters. This concern in August, 1892, was killing 44,772 hogs in a month, which is more than any one packinghouse in the world had killed in the same time.¹¹ The total killed in Omaha in that month was 120,448 hogs. In a short time the Cudahy company was erecting a range of car repair shops to facilitate the transportation of its products in its fast increasing business,¹² and by 1897 this firm was negotiating for ground in Youngstown, Ohio, and in many other places on which to erect refrigerators and storehouses.¹³

Following the Cudahy company, the G. H. Hammond Company went to South Omaha to erect a plant. Swift and Company built a plant in Omaha, and Armour and Company in 1897 decided to establish itself there also.¹⁴ The coming to Omaha of these large packinghouses made possible the development of allied interests. The *Omaha Bee* stated that the packing plants were the forerunners of additional factories to work up the by-products, such as tanneries.¹⁵ Such was the extraordinary growth of Omaha, a part of this westward movement of the large-scale packing industry. To quote the *South Omaha Daily Stockman*, in 1894, "ten years ago the history of South Omaha's stockyards interests was a blank. Today it stands as the third livestock market and packing center in the United States."

Sioux City and Meat Packing

Some distance northwest of Omaha, Sioux City, Iowa, began to assume some importance as a packing center. The first packinghouse in Sioux City was erected about 1875 by James E. Boage. It was some twelve years later, in the fall of

¹¹ *The National Provisioner* (Sept. 10, 1892), Vol. V, No. 24.

¹² *Ibid.* (Apr. 21, 1894), Vol. IX, No. 16.

¹³ *Ibid.* (Jan. 23, 1897), Vol. XVI, No. 4.

¹⁴ *Ibid.* (Aug. 21, 1897), Vol. XVII, No. 8.

¹⁵ *Ibid.* (July 17, 1897).

1887, that the Union Stockyards opened, which by 1895 had received 606,380 cattle, 3,408,302 hogs, and 156,442 sheep, with a total value of \$50,000,000.¹⁶ In the nineties the larger packers began to consider Sioux City, and in 1892 the Cudahy Packing Company bought a packing plant from Edward Hutchinson and Company, which had formerly been under the control of the Union Stockyards Company. Michael Cudahy stated that he considered Sioux City one of the best stock markets in the country and he went there rather than to St. Joseph and St. Louis at that time, although offered large bonuses to go to the latter cities.¹⁷ A few years later, in 1897, the Cudahy firm bought out the long abandoned plant of the Sioux City Dressed Beef and Canning Company, equipping it with the latest machinery at an expense of some \$300,000. About the beginning of 1901 the Sioux City Provision Company was incorporated by Chicago capitalists to carry on the business of the International Packing Company at Sioux City.¹⁸ Other of the larger packers, including Swift and Company, soon established plants at this point. In 1902 Armour and Company and Swift and Company, at the request of local interests, agreed to support the Sioux City stockyards, which were practically bankrupt, and to aid in developing the allied interests.¹⁹

Other Iowa Packing Points

Throughout Iowa there grew up many important smaller packers. For example, there was T. M. Sinclair and Company, at Cedar Rapids, established in 1871, Jacob E. Decker and Sons at Mason City, and John Morrell and Company, at Ottumwa. The founder of the Sinclair firm was Thomas M. Sinclair, who learned the pork business in Belfast, Ireland. Coming to New York he set up in business and forming a partnership with John Sinclair, developed a large trade. With

¹⁶ *The National Provisioner* (Jan. 12, 1895), Vol. XI, No. 2.

¹⁷ *Ibid.* (Dec. 3, 1892), Vol. VI, No. 11.

¹⁸ *Ibid.* (Mar. 16, 1901), Vol. XXIV, No. 11.

¹⁹ *Ibid.* (Oct. 18, 1902), Vol. XXVII, No. 16.

keen perception he saw that pork packing would eventually be a big industry in the West and about 1870 he located at Cedar Rapids in the heart of one of the finest hog raising regions in the world.²⁰

The firm of John Morrell and Company contributes a very interesting chapter to the history of the meat-packing business. The foundation of the Morrell business was laid in Yorkshire, England, in the late twenties of the nineteenth century. The hams put up by this firm soon acquired an enviable reputation in the London market and later it became difficult to obtain sufficient hogs to meet the increasing demand, and in 1855 curing houses were established in Ireland.

In 1868 the attention of the company was directed to Canada, and inside of four years it was using the output of four packinghouses located in that country. Between the years 1871 and 1874 the Morrell packing business was concentrated in Chicago; but in the winter of 1877, investigation having demonstrated the excellent quality of the Corn Belt hogs, packing operations were begun at Ottumwa, Iowa. In 1888 the Chicago houses were closed and the company drew on the Ottumwa plant for all of its meats. Later, in 1911, the company completed and put into operation a new packing plant at Sioux Falls, South Dakota.

The advantages in the locations, such as those of the Morrell, Decker, and Sinclair establishments, are numerous, chief of which is the proximity of packing plants to the farm where the corn-fed hog is raised. As a consequence the hogs are not subjected to long, tiresome, and injurious railway journeys, just prior to being slaughtered.

St. Paul, Denver, and California

The growth of the foregoing meat packing centers has been followed at a later time in much the same way by many others into which it is impossible to go at length at this time.

²⁰ *Butchers' Advocate* (Dec. 7, 1892), Vol. XIV, No. 3.

Such was the experience at St. Paul in the middle nineties, and at Denver which became the headquarters for the American National Livestock Association. At both places it was found necessary to offer inducements to larger packing companies to establish plants there. More recently some packing companies have established plants on the Pacific Coast at Portland, Oregon, at San Francisco and other places in California, where the pioneer packers were Miller and Lux, the ranch kings who fought the eastern dressed beef.

In California and the Southwest, Los Angeles is apparently destined to become the center of the meat packing industry: (1) because it is becoming more and more surrounded by cotton fields, alfalfa pastures, and sugar beet plantations, which may be counted upon to furnish a steady supply of inexpensive and good feed; and (2) because it is the nearest common shipping point accessible to the large cattle and sheep ranges of the Southwest. For though cattle are slaughtered and sold by butchers in even the smallest towns, the chief marketing centers of this region, south of San Francisco and Ogden, and west of Denver are Los Angeles and Phoenix. There are other minor packing centers in the San Joaquin Valley and along the coast of southern California, but these are relatively unimportant, except for supplying local demands. Packing at Los Angeles is carried on by the Cudahy Packing Company and Wilson and Company, the Hauser Packing Company, the California Dressed Beef Company, the Standard Packing Company, and the Newmarket Company.²¹ Later still was the development of Oklahoma City as a packing center, where in order to provide a permanent cash livestock market, the two large packers, Morris and Company and Sulzberger and Sons Company, had to subscribe for the majority of the stock.

²¹ The "Cattle-raising Industry of the Southwest," issued by the Security Trust and Savings Bank, Los Angeles, Cal. This is an interesting and instructive original study prepared by C. C. Lincoln, Department of Research and Service (1921).

Texas Packing Growth

Further south in Texas there has been a great development in meat packing, lifting it from a local to a national level. For years now pork and beef packing had been carried on, but not until the last decade of the last century did it begin to grow as a part of the American packing industry. Among the companies which aided in this pioneer work was the Dallas Dressed Beef and Packing Company, which later became the Armstrong Packing Company, and the Fort Worth Packing Company, later bought by the Chicago Packing and Provision Company. Many of these were organized by eastern and Texan capitalists in the belief that it was necessary to have a home livestock market and packing houses in the greatest livestock state in the country. It was, however, only in 1902 that the larger packers, Swift and Armour, for example, established plants at Fort Worth and undertook to finance the stockyards in response to requests of that city. This brought the industry in Texas definitely in touch with the main national developments of meat packing.

In the last few years there has been going on a growth of meat packing in the southern states east and north of Texas, in the old South, e.g., Georgia, Tennessee, Alabama, and Florida. Swift and Company has a plant at Moultrie, Georgia, and Andalusia, Alabama, and Armour and Company at Jacksonville, Florida. There are also other local packers in these states who are doing a good business, such as the White Provision Company of Atlanta, Georgia.

CHAPTER XXI

MEAT CANNING AND WAR SERVICE

Discovery of Canning Process

Until the early part of the nineteenth century the only methods for preserving foods were drying, pickling, smoking, and preserving in sugar. The direct cause of the discovery of the efficacy of the hermetic sealing of foods to keep them in good condition was the Napoleonic War. About the end of the eighteenth century a prize was offered by the French government for the most practical method of preserving foods for sea service and military stores. As a result of this offer Nicholas Appert of Paris, a Frenchman, was stimulated to begin experimenting. After working on the problem from 1795 to 1809 he submitted to his government a treatise on the means of preserving foods and won the prize of 12,000 francs. The following year he published the results of his experiments.¹ Appert had had a wide experience for 50 years as pickler, preserver, brewer, distiller, and chef, and he so perfected the art of canning in glass that, according to experts, even now it is difficult to surpass his processes.

Appert's process consisted in enclosing the articles to be preserved in glass jars, which were then corked and exposed in open kettles to the action of boiling water for varying lengths of time, according to the nature of the article treated. While Appert had no conception of the rôle played by micro-organisms in the spoilage of foods, his experiments clearly showed that a vacuum alone was not sufficient for the preser-

¹ Powell, Ola, *Successful Canning and Preserving*, Chap. I, "History of the Development of Scientific Canning."

vation of foodstuffs, and that the application of heat and the subsequent exclusion of the outside air were essential to their successful preservation. It is now known that the air contains micro-organisms of germs which are responsible for the fermentation and putrefaction of foods.² At first the secret of the process was carefully guarded, but in time the employees of the different establishments became more or less familiar with the details of the process and in this way the method was carried, about 1815 or 1818, from England to America.

First Canning in America

Ezra Daggett is said to have brought the secret to America, and as early as 1819, in partnership with his son-in-law, Thomas Kensett, he was engaged in the packing of hermetically sealed foods in New York City. Lobster, salmon, and oysters were among the first goods packed in America, but by 1825 fruits and vegetables were also canned.

In the early days of the canning industry glass jars were employed, but owing to their bulkiness, cost, and easy breakage they were gradually abandoned for tin containers, which first came into use in 1825, when Thomas Kensett secured a patent on the use of tin cans in preserving foods. The cans were at first made entirely by hand, and their early manufacture was crude, costly, and tedious, the making of 100 cans being considered a good day's work. The introduction of labor-saving machinery, however, has greatly lessened the cost of production, and the manufacture of cans has become a distinct industry. Cans are now made entirely by machines, which cut the different parts and fit and solder them together, turning out the finished can with incredible rapidity. A single machine can now turn out as many as 90,000 cans a day.

While the canning industry was established on a commercial basis in this country as early as 1825, it has only been

² Yearbook Department of Agriculture (1911), "Commercial Methods of Canning Meats," by Dr. C. N. McBryde, Senior Bacteriologist, Biochemic Division, Bureau of Animal Industry, p. 38.

within the last 40 years that the industry has become one of much importance. At first there was considerable skepticism on the part of the public in regard to the healthfulness of canned goods, and a more or less widespread prejudice existed against their use. This prejudice has now largely disappeared, however, and the cost of production has been greatly lowered through the introduction of labor-saving machinery. Canned goods have now come into general use and meat canning as a part of the meat packing industry has achieved great economic importance.

During the Civil War in the United States large quantities of beef, preserved by methods similar to, if not identical with, those covered by the Appert patent, were used in the United States navy. Most, if not all, of this beef was put up in the cities of Portland, Maine, and Boston, Massachusetts, under patents issued to Hezekiah Winslow. Meats preserved in this way were placed in a raw state in cans, which were then put into vats and thoroughly cooked, the cans being sealed immediately after the cooking. Thus treated, the contents of the cans consisted of a considerable quantity of fluid in which the meat was suspended loosely. The flavor of the beef thus preserved was not very agreeable, as it seemed to have been scorched.

Chicago Meat Canning

On March 31, 1874, the business of putting up compressed cooked beef in tin cans of pyramidal form began in Chicago. The Wilson Packing Company was the first firm or corporation to pack compressed beef, so called, in cans of that shape. William J. Wilson, senior partner of the firm, introduced these goods into the New York market by carrying samples around in a basket and showing their merits to the trade. The business was very discouraging for a time, many not hesitating to say that Wilson was a lunatic. From that seemingly insignificant and unpromising beginning the trade in

canned meats has extended to the markets of every nation, and by 1884 it was evident that in the opinion of the people of all lands where such meats have been introduced they constitute a useful and economical food. At the beginning of the eighties Wilson retired with a considerable fortune.

The second firm to enter the business of packing compressed meats was that of Libby, McNeill and Libby, which began the business in January, 1875, having arranged with the Wilson Packing Company for joint rights and privileges under the patents issued to them by the United States Patent Office and believed fully to cover and protect all the processes employed in canning compressed meats. Next in order of those who entered the field was a corporation styled the St. Louis Beef Canning Company. It began packing meats by the processes described in the patents issued to the Wilson Packing Company and to Libby, McNeill and Libby. Suits were at once begun by the last named firms to restrain the St. Louis Beef Canning Company and others from using those processes in violation of the patents referred to, but the Supreme Court of the United States held that the patents in question were invalid.

Rapid Growth of Canning

During the ten years following the beginning of this canning the number of cases packed by these processes exceeded by several millions the total output of meats preserved by all other methods during the whole of the previous three-quarters of a century. That the consumer was benefited to a considerable extent by the change in the methods of packing was clearly apparent. The saving in cost resulting from the reduction in the amount of metal used, in the labor required, and in the cost of transportation of the metal, together with quantity of meat that could be put into the cans, was in the aggregate very large. One Chicago firm put up 35,775,663 cans of beef in one year. These cans were 1, 2, 4, 6, and 14 pounds

each. If all this meat had been put up in the old way with 25 to 35 per cent moisture, the consumer would have been called on to pay the freight on some 60,000,000 pounds of water. The chief gain to the consumer, however, was in the improved flavor of the meats preserved by the new processes.

From time to time after 1875 a number of firms entered the business, but retired from it in a few years. Some were unsuccessful while others retired for other reasons.³ By 1880 American canned beef had taken the place of salt beef in ships stores and three years later the canning of beef had spread to Australia and New Zealand, which were shipping canned beef to European markets at lower prices. This was followed by Liebig, who was the pioneer of this business in South America at Montevideo, where he made his famous extract of beef. His process was adopted by American canned beef packers.⁴

Recent Canning of Meats

In 1910, out of the 795 establishments with federal inspection for the slaughter of livestock and manufacturing, only about 40 were engaged in the canning of meats;⁵ because of the idea that canning only paid when done on a large scale. That idea was incorrect, however, as is shown by the considerable number of small canners in the United States who can meats, but do not slaughter livestock. They purchase their raw materials from the packers, operate almost the whole year around, and are prosperous.⁶

³ American Meat Canning Company, St. Louis, Missouri; The Denver Packing Company, Denver, Colorado; Omaha Packing Company, Omaha, Nebraska; Kingan and Company, Indianapolis, Indiana; Hannibal Meat Company, Hannibal, Missouri; Slavins, Ohern and Company, Kansas City, Missouri; Boston Beef Packing Company, Fulton, Texas; Chicago Packing and Provision Company, Chicago; Chicago Meat Company, Chicago; Ashwell and Company, Chicago; Anglo-American Packing and Provision Company, Chicago; and James Turner of Chicago. The firms which continued in business in the United States in the order in which they began: Libby, McNeill and Libby, Chicago; Plankinton and Armour, Milwaukee; Plankinton and Armour, Kansas City, Missouri; Lees, Hendricks Company, Chicago; Fairbanks Canning Company, Chicago.

⁴ First Report Bureau of Animal Industry (1884), "Beef Canning," by Edward W. Perry, p. 262 *et seq.*

⁵ Allen, John W., "Meat Canning," paper read at Convention of American Meat Packers' Association, 1910.

⁶ See also Home Canning of Meats and Sea Food with Steam Pressure Canner, by Franz P. Lund, Specialist, Office of Extension Work in Agriculture and Home Economics, U. S. Department of Agriculture (1919); also *The National Provisioner* (Feb. 20, 1909), Vol. XL, No. 8.

In the canning of meats the great variety in the products prepared renders necessary considerable variation in the methods employed, each product requiring a somewhat different treatment. Only a general description of the more important processes can be given here.

In the case of meats which are "processed," or heated in the can, it is customary to subject the meat to a preliminary cooking or parboiling before placing it in the cans. This is done in order partly to cook and at the same time to shrink the product. The cooking is carried on in large iron tanks, fitted with iron tops, used to cover the meat, and the water is heated by means of perforated steam coils in the bottom of the tank. When the meat has been sufficiently cooked it is removed from the boiling water by means of large metal forks and is transferred to the trimming bench, where the gristle, surplus fat, and bone are trimmed off. The meat then goes to the cutting machine, which cuts it to pieces, according to the size of the can to be filled. After it is cut to the proper size, the meat is passed down through a metal chute to a lower floor to be packed in the cans. Gravity is utilized as much as possible in handling the meats. The cooking is usually done at the top of the building, and the meat is then passed down from floor to floor, being subjected to the various manipulations of the canning process on its downward journey.

Speed and Cleanliness

In the plants of the large packers, the work in the canning rooms is largely done by girls, who become wonderfully quick and adept. They are furnished by the establishment with clean, washable uniforms, and present a neat and tidy appearance. Most of the larger plants also employ manicurists to care for the girls' hands and see that they are kept clean and sanitary.

In the case of corned beef and potted, or deviled meats, the cans are filled by machinery. The stuffing machines, which

usually work on the rotary principle, consist of a series of pistons and cylinders. The cans are placed beneath the cylinders, into which the meat is fed from above and is forced down into the cans by the pistons. When the can leaves the stuffing machine it is weighed and adjusted to the proper weight by adding to or taking out a little of the meat. After the can has been weighed and the necessary adjustment made in the weight, the cap is next put in place and soldered under a rotary soldering machine. The capping machines consist of a series of small revolving tables upon which the cans are placed, with the tops laid loosely in position. The caps are then clamped down from above, and are soldered, either by hand or by automatic soldering irons. When the cans leave the capping machine they have been completely sealed except for the small ventholes in the top, through which the air within the cans is to be later exhausted.

Care in Sealing Cans

The next step in the canning process consists in exhausting the air from the interior of the can. This is usually effected by means of vacuum machines, which consist of a large circular iron box with air-tight doors and a small glass window through which the vents are sealed by means of an electric soldering iron. The machine is filled with cans and closed, the vacuum then applied, and the vents are sealed as the cans are brought beneath the window on the movable bottom of the machine.

From the vacuum machine the cans are run out on tables and again inspected for leaks, after which they are ready to be processed. Processing consists in heating the cans to a sufficiently high temperature to insure the preserving of their contents, and constitutes one of the most important steps in the whole canning process. Two general methods of processing are followed, known as the "retort" process and the "water" process.

Processing Methods

In the retort method of processing, the cans are placed in large iron or steel boilers, known as "retorts," which can be securely closed by means of bolts. In these retorts the cans are subjected to the action of steam under pressure, and in this way high temperatures can be secured. The length of time the cans remain in the retorts and the temperatures employed depend upon the nature of the product and the size of the cans.

In the water method of processing, the cans are placed in large open kettles or tanks filled with water, which is raised to and maintained at the boiling temperature by means of steam pipes. The cans remain in the boiling water for varying lengths of time, depending upon the size of the can and the nature of the product.

After they have been processed, the cans are placed under a cold spray and allowed to remain until thoroughly chilled. When they leave the retorts or kettles in which they are heated, the ends of the cans are bulged outward owing to the expansion of the contents by the heat to which they have been subjected, but after they are chilled the ends of the cans draw in and present a slightly concave appearance. The cans are now subjected to another inspection, and any that are defective or leaky may be readily detected, as in these cans the ends remain bulged after chilling. The cans are next passed through a washing machine, which consists of a long iron tank fitted with a movable carrier, by means of which they are slowly passed through a hot solution of caustic soda. This is done to remove any fat or grease that may adhere to the cans, and is necessary in order that they may be subsequently painted. After passing through the soda solution the cans are washed with hot water in order to remove the alkali. After another inspection, the cans are ready for painting and labeling, which constitute the finishing touches whereby the cans are transformed into the attractive packages which are seen on the

shelves of the grocery stores. Both labeling and painting are mostly handwork. Machines have been devised, but do not seem to be altogether satisfactory.

Government Inspection

The canning of all meats at establishments which conduct interstate or foreign trade is carried on under the supervision of government meat inspectors, who watch the process from start to finish. The government inspectors are men who have had years of practical experience in the canning of meats, and have at their fingers' ends the detail of the various processes employed. These men not only watch the condition and quality of the meats that go into the cans, but are careful to see that the meats are handled in a cleanly and sanitary manner and that the methods of processing are adequate and thorough.

The proper methods of processing the various meat products have been carefully worked out and perfected by the different packing establishments. As a check on their methods of processing, however, most establishments maintain test or hot rooms, which are small rooms fitted with tiers of open-work metal shelves and maintained usually at a temperature of 100 to 110 degrees F. A sample batch of each run of canned goods is placed in the test room and kept there for a week or ten days, and if at the end of this time the cans show no signs of swelling the packer feels sure that his cans have been properly processed and that they will withstand even the summer temperature of a warm climate.

Embalmed Beef Episode

So far this study of the development of meat canning has been confined to normal peacetime progress, but "canned meat" or "tinned meat," as the phrase goes in England, has a war-time significance as well. In connection with the Spanish-American war, for example, there developed the so-called "embalmed beef" scandal, which aroused great comment both

in the United States and abroad, and which was distorted out of all proportion to its true significance by certain journalists. Since it was a matter of such public controversy at that time, it is worth while to consider briefly the real circumstances of the case.

First, it is well to recall the fact that every war has its scandals, many of them like that of the war of 1898. For example, General Sherman wrote in April, 1863, when his army was before Vicksburg:

If the newspapers will only discuss matters within their knowledge parents would not be kept frantic with accounts of sickness and death. . . . We have hundreds of visitors daily because correspondents represented us all as dying when the truth is no army was ever better provided for or supplied.

During the Spanish-American war there were two different sorts of meat rations—dressed beef and canned meat. It was with regard to the first that the phrase “embalmed beef” arose. Apparently it was first used by Major General Nelson A. Miles, who commanded in Porto Rico, in a statement before the War Investigating Committee to the effect that:

In my judgment there is some serious defect in that refrigerator beef and also the canned beef that was furnished. There was sent what is known as or called refrigerated beef which you might call embalmed beef.

With the outbreak of war there came a sudden and unprecedented demand for meat products. Before that, indeed, by March 26, 10,000,000 pounds of various kinds of canned meats had been ordered by the government in addition to the regular supplies. Many American packing and canning companies were filling orders, among them Libby, McNeill and Libby, Armour and Company, the International and Wells Packing Company, the Jacob Dold Packing Company, the G. H. Hammond Company, and Morris and Company. Such great amounts of meat products could not be specially prepared for the purpose and had to be taken from the available

stock on the market, which had been for years a recognized wholesome food. As for the refrigerated beef any process—even if the packers had felt disposed to pursue such a plan, in view of the perfection of refrigerating methods which were employed—would have been so easily subject to detection that the idea was ridiculous, especially as every piece of meat was inspected.

Packers Not to Blame

This was the conclusion of two special investigations appointed by President McKinley, namely, the War Investigating Committee and the Court of Inquiry. The latter found it impossible to locate any great quantity of defective cans, and careful inspection indicated no unusual loss from deterioration in quality or defective packing. This court went further, indeed, and stated that no report of bad canned roast beef had been made until December 21, 1898, when General Miles, who was in command, made the statement quoted above before the commission appointed to investigate the war with Spain; that regarding canned beef no neglect on the part of the army officers was found; but that as for refrigerated beef there was neglect in the time taken in delivery to the troops, when wagons were often not clean, and there was no protection from the sun and rain. As a result the troops had suffered much. There was failure as to system and the fault rested with the brigade and higher commissary officers.

This verdict of the court was a complete vindication of the meat packers of the country, but the incident had a bad effect upon the export trade. During the fiscal year 1897, the United States exported meats, live and dressed, to the value of \$125,000,000. In 1898 that trade increased to \$156,000,000, but for the next few years the trade was very greatly cut down.

Yet foreign governments continued to get supplies from the American meat packers. During the South African War the British government contracted in the United States for

canned meats for the troops. Orders were placed in Chicago, Louisville, and Kansas City, to be shipped to Cape Town. In 1900 the Boxer trouble in China caused a great demand for canned meat.⁷ During the Russo-Japanese War the same thing happened. Finally, the American canned beef or meats regained complete supremacy. In 1909 the British War Office closed 3-year contracts with a large packer in Chicago for 7 to 10 million pounds of canned beef. After full investigation, these contracts were awarded to the firm in Chicago in the face of Argentine and Australian competition.⁸

Packers and the World War

It was during the great European War of 1914-1918, however, that the meat packing industry made its most remarkable achievement.⁹ In the first five months of 1918 the United States exported a billion and a half pounds of meat—fresh, cured, and canned. The monthly average of beef exports for the three years preceding the war was 1,066,000 pounds. In June, 1918, however, the beef exports were 92,173,000 pounds. For the three years before the war the monthly average of pork products was 41,500,000 pounds, whereas in June, 1918, they were 169,300,000 pounds.

The war needs brought problems in manufacturing of canned and cured meats which were stupendous. Speed made necessary wherever possible the substitution of machine work for hand operations. Power band saws did the work of the old handsaws at greatly increased efficiency. Whittling disc knives cut the meat into strips and squares.

The center of activity was Chicago, although many meat packers throughout the country were busy also. In the Chicago plants, 1,500,000 pounds of boneless meat went into cars every day. In one canning plant, 5,000 people were employed

⁷ *The National Provisioner* (July 28, 1906), Vol. XXXV, No. 4.

⁸ *The National Provisioner* (Feb. 27, 1909), Vol. XL, No. 9.

⁹ *McClure's Magazine*, Dec., 1918, "Packing for Pershing," by Edward Mott Woolley.

and 2,000 cattle a day went into various sorts of canned goods. In a sense the meat canning industry became necessarily a war industry. The increase in the number of workers was from 100 to 200 per cent in a year, while the production itself, as a result of intensive mechanical methods, went up in much greater ratio. As Edward Mott Woolley has stated in an interesting article, "perhaps no other industry has witnessed such a concentration of machines, appliances and workers in the same number of square feet."

It is impossible to enter into a detailed description here, but a few things may be noted to give some indication of the scope of operations necessary.

Making Corned Beef Hash

One of the most popular products was corned beef hash, whose production increased 800 per cent in one year, one company making 180,000 pounds of it a day. In this department were long tables aggregating hundreds of feet in length, at which scores of women, gowned and capped, standing close in line, were peeling boiled potatoes with great speed. On one side of the great room was a battery of power choppers. From these choppers the hash went to the stuffing rooms, where automatic machines put it into cans, a single machine filling 20,000 2-pound cans a day. Every operation was automatic, the pace bewildering. One army order called for 25,000,000 cans.

The so-called "kitchens" of the larger packing plants have, as Mr. Woolley has stated, literally acres of enormous cooking tanks in which are boiling hundreds of tons of meats, which are stirred mechanically and lifted by air hoists. This meat when cooked is carried by hanging railroads to chutes, down which it passes by gravity to the different departments. The vast soup kitchens are filled with caldrons in which are being prepared tomato, chicken, mock turtle, mulligatawny, and vegetable soups.

During the war so far as possible the special tastes of the different allied armies, American, English, French, and Italian, were filled by the canning and curing departments. For the French army there were huge amounts of special boiled beef shipped. This was highly seasoned with pepper, salt, allspice, and such things. The name given to this was *boeuf assaisonne*, and it required a special canning room. A great deal of this was prepared in South American plants. On the other hand, the British army took immense quantities of corned beef, although all the armies, except the Italian, liked it. As a result the production increased 300 per cent in one year. One order alone called for 50,000,000 12-ounce cans. The Italians took instead of corned beef a large amount of boiled beef. The French and Italians were fond of special cuts of cured pork, largely fat, while the Anglo-Americans' tastes ran in the other direction. A favorite canned product with the English and Belgians was known as "rations," comprising one-third beef and two-thirds vegetables.

War Meat Problems

From these brief statements some idea can be gained of the great problems of production, but the biggest problems were to get the products through to the Atlantic ports on time, and to get the dressed and canned and cured meats loaded on the steamships without delay and deterioration. This was most difficult, for ships often arrived without advance notice because of the danger of sending wireless messages. The instant that a ship came in, therefore, the machinery of the whole distribution system of the packing industry began to function with extraordinary speed. It was in preparation for just such emergencies that immense supplies of meat and meat products were kept in reserve in the refrigerator rooms. In its curing cellars one big concern averaged 100,000,000 pounds of meats in various stages of preparation.

Speedy Meat Distribution

The importance of having a well-articulated national system of distribution was clearly shown. When one of these rush orders came, hundreds of men were shifted from other departments and set to work handling and loading the products required. In filling one rush order a Chicago packing company in one week shipped 1,000 carloads, two-thirds for the allied nations, which amounted altogether to some 32,000,000 pounds of meat products. Of these, 20,000,000 pounds were fresh and frozen beef cuts, 8,000,000 pounds of cured pork products, bacon and ham, 350,000 pounds of lard and oils, 730,000 pounds of other products. The same company averaged weekly shipments of 20,000,000 to 25,000,000 pounds, and on one occasion, when it was necessary to utilize steamer space in a hurry, 24,000,000 pounds of meats and fats were shipped from Chicago on three days' notice.

To fill such orders required the most vigorous mobilization for war. It is only in considering the details to be looked to in reaching the final satisfactory results that one realizes just what it involved. Some of the chief details can be summarized as follows:

1. Departments and machinery and tools had to be kept clean, sanitary, and in good repair; for highest efficiency also the workmen had to be neat and clean.
2. Temperatures had to be watched carefully and the various degrees for the different departments strictly adhered to.
3. Proper inspections, and in many cases special chemical analyses had to be made to keep each separate product up to the required standard.
4. Products had to be carefully weighed, check-weighed, and packed.
5. Age limits had to be closely followed so that the consuming trade received fresh and properly cured products at all times.

6. Loading and icing of cars for the perishable products had to be followed very carefully and the icing of cars followed through to destination so as to insure good condition on delivery.

Other Service of Packers

It is curious that the general public did not realize the real scope of the work that the packers were doing to help win the war. Most people knew, of course, that the packers furnished meat and meat food products, but not one in a hundred had any idea that the packing industry went further than that. For example, the industry furnished a great deal of material for the manufacture of munitions including glycerin, potash, and sulphuric acid. Besides this, sheep skins were used to manufacture cold-proof coats. Every pound of wool was taken by the government as fast as the packers could produce it, and at a price fixed by the government. All the stock food made by the packers went to put weight on livestock which were later food for the troops. The tons of fertilizer which the packers turned out aided in the growing of more crops. Glue also had its uses. Soap was a big item. Albumen was another highly important product used in the construction of aeroplanes. These were but a few of the ways in which the packing industry did remarkably important war service.

Many anomalous administrative problems were brought by the war. Before any foreign shipment could be made a long list of documents had to be executed, including invoices, certificates of the Bureau of Animal Industry, weight slips, bills of lading, consular invoices, and the OK's of inspectors of various countries. When the large orders were rushed through to meet sailing schedules, it was necessary to have the office force able to keep pace. New methods had to be worked out, schools for training office forces were established, and the offices were specially equipped with every kind of labor-saving

machinery, such as calculating, duplicating, and bookkeeping machines. Even with this equipment some offices had to double space and force and some even had special night office forces. By means of private wires operated between New York, Boston, Philadelphia, Washington, Baltimore, Cleveland, Milwaukee, St. Louis, Omaha, Kansas City, St. Paul, and other points, such speed was possible that within 36 minutes after a certain big order for army meat was received, it had been divided among the various branches and instructions flashed to each of them.

Packer Service in France

The meat packing industry's contribution did not cease with the shipping of meat products from America. It was employees of the meat packing industry, as was stated in *Le Matin*, who constructed the huge army refrigerating plant in central France. That plant covered several acres and had a capacity of 10,400,000 pounds of meat, which is the equivalent of 15,000 head of cattle weighing an average of 700 pounds apiece. In addition to the necessary plant refrigeration it had facilities to turn out daily 500 additional tons of ice for icing refrigerator cars. The Parisian paper declared this a most striking and characteristic example of American genius and energy. In this the American packing industry was the means of proof of Napoleon's famous dictum regarding the winning of a war, "An army travels on its stomach."

PART III

SOME LIVESTOCK FINANCING AND
MARKETING PROBLEMS

CHAPTER XXII

GRADES AND CLASSES OF LIVESTOCK

Classes of Cattle

Having considered in Part II the general development of cattle, hogs, and sheep from 1880 to the present, it is logical to note the different market types and classes of livestock which are raised and marketed for packing purposes at the present time. With such a classification considered, the way is prepared for a discussion of marketing and financing problems of the livestock and meat industry.

Cattle which are used for the production of beef are divided into two general classes, the strictly beef breeds and all others.¹ The former are, as the name implies, valuable mainly for the production of meat, and have been carefully bred and developed in order to produce a maximum amount of beef of high quality. Care has been taken to develop to the greatest extent those portions of the body from which are secured the high-priced cuts of beef. The cows give milk enough for their calves, but not much more. The dual-purpose breeds are a class of cattle which have been developed to produce a fair to good quality of beef, while at the same time the females should give a good flow of milk.

Beef Cattle Breeds

The main breeds of beef cattle in the United States are the Shorthorn, Hereford, Aberdeen-Angus, and Galloway. Each of these breeds has been carefully developed for a long

¹ U. S. Department of Agriculture Bulletin No. 612, "Breeds of Beef Cattle," by W. F. Ward, Senior Animal Husbandman in Beef Cattle Investigations, Animal Husbandry Division.

period, with the result that individuals transmit their characteristics very readily when bred to native or scrub cattle.

SHORTHORN. The Shorthorn is the most popular of the beef breeds in the United States, as shown by their numbers and by their general distribution throughout the country. It is the largest breed of beef cattle. The bulls attain a weight of 1,800 to 2,400 pounds or more, while the mature cows usually weigh from 1,300 to 1,800 pounds when raised under favorable conditions. Greater weight in both cows and bulls is often found but extremely heavy animals are not especially desirable. The color of this breed may be red, red and white, pure white, or roan. As no other breed of cattle has the roan color, this color in any other cattle usually signifies the presence of some Shorthorn blood. The Shorthorn is of the true beef type, being wide, deep, lengthy, and thickly fleshed. The great width of the Shorthorns, combined with their depth, gives them a more rectangular form than that of any of the other breeds, while the wide variation in the distribution of the breed has caused a slightly greater difference in type to be recognized than in other beef breeds.

HEREFORD. The Hereford ranks next to the Shorthorn in the United States. The weight of Hereford cattle is practically the same as that of the Shorthorn, but they look smaller than do Shorthorns of equal weight. In color the Hereford is red with white markings. The white markings usually consist of a white face and head, the white extending along the top of the neck and shoulders, a white throat and dewlap, and white on the underline.

The general conformation of the Hereford is the same as that of the Shorthorn, except that the rectangular aspect is not quite so pronounced, and the prominent bones are more smoothly covered. The form is low, compact, and blocky, with well-sprung ribs, broad loin, and wide hips. The head is broad and short with large nostrils, and large muzzle and mouth, which are indications of a good feeder. The horn is



Choice to Prime Heavy Steer



Good to Choice Heavy Steer



Common to Medium Steer



Inferior to Common Steer



Choice Yearling Steer



Good Yearling Steer

Courtesy Armour's Livestock Bureau

Figure 27. (a) Grades and Classes of Cattle

longer and somewhat coarser than the Shorthorn, white in color with waxy tips, and curves outward, upward, and backward, or outward, forward, and occasionally drooping. The neck is short and thick, and blends well with the shoulder. Great width, depth, and length of chest and a fullness of the crops give the Herefords their constitution and endurance. The loin is full and deep and the rump and hind quarter are usually well developed, carrying a large amount of flesh.

ABERDEEN-ANGUS. While the Aberdeen-Angus is an old breed, it is only within recent years that it has become very popular in the United States. Black in color and without horns, in general form Aberdeen-Angus cattle differ markedly from the Shorthorn and Hereford. The body is more cylindrical in shape, and they are smoother throughout than either of the former breeds. The Angus shows a marked readiness to fatten, and has early maturity, exceptional vigor, high quality, general smoothness and uniformity.

GALLOWAY. The Galloway is one of the oldest breeds of cattle. Galloway cattle are polled, solid black in color, though occasionally some brown is shown. They have a double coat, the outer long and curly, and the under, short, dense, and woolly. This breed is very prepotent and transmits the black color and polled characteristics readily to offspring from cows of any color. This breed is slow maturing, when compared to the Aberdeen-Angus or the Hereford. In size, Galloways are smaller than any of the other beef breeds. Mature bulls usually weigh from 1,700 to 1,900 pounds, while mature cows weigh from 1,000 to 1,300 pounds each.

In form they are low set and deep, but are proportionately longer than the Aberdeen-Angus, and flatter of rib. The head is somewhat similar to that of the Angus, except that the poll is not as sharp. The head is covered with long wavy hair, and the ear is set further back from the forehead. The body is long and of medium depth. The rump is long and well filled, although the tail head is usually set rather high. The

hind quarter is usually good, being full, similar to that of the Angus. The bone is fine, the skin mellow, the hair soft and silky, and the grain of the meat is fine and high in quality.

Dual-Purpose Cattle

Dual-purpose cattle have been bred to produce females which would yield a good quality of milk and produce offspring which would be desirable for beef. As the type of animal necessary for the production of large yields of milk is entirely different from that of the beef animals, it has been impossible to produce a breed which would combine the functions and be of superior merit for both purposes. At present the principal dual-purpose breeds in the United States are certain types of the Shorthorn, together with the Red Polls and Devons.

Native, Western, and Texas Cattle

Beef cattle coming upon the western markets present a considerable variety as a merchantable article, depending chiefly on breed, grade, weight, and conditions of age and sex. Thus far attention has been given exclusively to breeds.

To the packer these principal breeds were until recently still further classified in the trade as Native, Western, and Texas, but now the latter has been dropped. These are further distinguished as to the place of fattening for market, and to some extent, according to the character of the feed on which they have been prepared.² The Native beefs include those bred and reared in the agricultural region of the Middle West, where many of the great packing plants are located. They are, generally speaking, fattened on corn and characterized as cattle of superior breed, with the accompanying qualities of large size and good quality of meat. The Western are cattle bred in the grazing states of the West and Northwest. They are largely of the same stock as the Native at the present day,

² "The Beef Industry," U. S. Bureau of Corporations (1905), p. 87.



Cutter Cow



Canner Cow



Butcher Cow



Butcher Bull



Good Stag

Courtesy Armour's Livestock Bureau

Figure 27. (b) Grades and Classes of Cattle (Continued)

but do not class so high on the average because of lack of flesh and finish. The principal difference is in the conditions of preparation for the market.

Western cattle are properly range cattle from the region west of the Missouri and north of the southern boundary line of Kansas. They include all grass cattle from that region. A good many of the cattle called Westerns in the trade are really corn-fed. Sometimes being fed on hay and alfalfa instead of corn, they are described as hay-fed Westerns. The western cattle fattened on the range are often confused with Natives. Fortunately a good many of the finer distinctions may be safely ignored here or at least may be reduced to a small number of more general classes.

Cattle Market Classes

Cattle are placed in classes according to the use to which they are put, while they are graded according to their merit in fulfilling this purpose.³ The three major classes are beef cattle, butcher stock, and feeders and stockers. Beef cattle produce carcasses suitable for the wholesale trade, of the better grades, Numbers 1 or 2, and of standard quality. Butcher stock produces either an inferior grade of carcass, or else only partially produces marketable cuts. Feeders and stockers are animals that must be developed further before being slaughtered, feeders being ready to go into the feed lot at once, and stockers being too thin or too small to fatten until they have been further developed on cheap feeds.

Each of these classes has a certain number of subclasses, although there is no rigid distinction between them, the daily condition of supply and demand materially affecting the classification. For example, light-necked, thin stags on one day's market may be slaughtered as a common grade of stag, while another day they may be sent back to the country as feeders,

³ This is based for the most part on "Progressive Beef Cattle Raising," published by Armour's Livestock Bureau.

depending upon the relative need for butcher stock or for feeders.

Packer View of Classes

The principal classes and subclasses of cattle from the packer point of view are indicated in the following outline:

Beef Cattle:	Veals:
Beef steers	Selected
Yearling steers	Medium
Yearling heifers	Heavy
Heavy heifers	Feeders and Stockers:
Stags	Feeder steers
Butcher Stock:	Yearling steers
Cows:	Yearling heifers
Kosher	Feeder cows
Butcher	Feeder bulls
Cutter	Springer cows
Canner	Springer heifers
Bulls:	Stocker steers
Butcher	Stocker heifers
Bologna	
Selected	

Of course not all the animals that are placed in a particular class on a given day are equally suited to meet the requirements of that class. Hence, they are graded according to their ability to realize these requirements. The standard grades are prime, choice, good, medium, fair, plain, common, and poor. Prime animals are fully finished and of improved type. Choice animals are practically as good in type, but are not so perfectly finished. Good animals are not as desirable as prime, either in condition or type. Medium steers are practically of the same quality as good, but are not their equal in condition, while fair steers fall below medium in quality, type, and condition. Both medium and fair steers are quite numerous on the market, nearly 50 per cent of steers falling in these two grades. Plain steers are deficient in type and quality, but carry some flesh, while common steers lack flesh to a greater extent. Poor steers are typical of their name, inferior in practically all respects.

General Description of Grades

The following general description of each of the grades of cattle will be found applicable on the average to cattle on the spring Chicago markets of 1920:⁴

GRADE	WEIGHT (Lbs.)	CONDITION	TYPE
Prime beef steers	1,500-1,600	Ripe	Excellent
Choice beef steers	1,250-1,450	Good	Excellent
Good beef steers	1,250-1,450	Good	Good
Medium beef steers . . .	1,240-1,400	Average	Average
Fair beef steers	1,050-1,250	Average	Average
Plain beef steers	1,000-1,150	Fair	Deficient quality and form
Common beef steers . .	900-1,050	Light	Few signs of good breeding
Poor beef steers	800- 950	None	Very inferior

Grades Applied to Other Classes

While the other classes and subclasses vary in weights from those quoted above, the general statements as to type and condition hold good throughout. In some cases a few of the grades are omitted, or new grades are created, to meet special conditions in a particular class of stock. The table appearing on the following page shows the grades applied to the other classes:

⁴ The following tentative classification was developed by the Bureau of Markets and Crop Estimates, now the Bureau of Agricultural Economics, primarily for use in reporting livestock market prices. It is intended to be sufficiently broad to cover all classes and grades of meat animals produced in the United States, and is believed to be the most complete classification ever proposed. It is not intended, however, to include disease suspects, certain seasonal classes, nor any animals not ordinarily quoted and not heretofore generally recognized as belonging to a standard grade. This classification is an ideal one towards which the Department of Agriculture is working with the hope that with such modifications from time to time as seem necessary it will be adopted as a standard one throughout the country. The cattle and calves classification is as follows for killing grades:

- I. Steers:
 1. Heavy Weight (1,300 lbs. up): prime, choice, good, medium, common.
 2. Medium Weight (1,100-1,300 lbs.): prime, choice, good, medium, common.
 3. Light Weight (1,100 lbs. down): prime, choice, good, medium, common, cutter, canner.
- II. Heifers: prime, choice, good, medium, common.
- III. Cows: prime, choice, good, medium, common, cutter, canner.
- IV. Baby Beef (steers and heifers): prime, choice, good, medium.
- V. Stags: choice, good, medium, common.
- VI. Bulls: choice (beef), good (beef), medium (bologna), common (bologna), canner.
- VII. Calves:
 1. Light weight (110 lbs. down): choice, good, medium, common, cull.
 2. Medium Weight (110-190 lbs.): choice, good, medium, common, cull.
 3. Strong Weight (190-260 lbs.): choice, good, medium, common, canner.
 4. Heavy Weight (260 lbs. up): choice, good, medium, common, canner.

CLASS	GRADES
Yearling steers.....	Prime, choice, good medium, fair, plain, common
Yearling heifers.....	Extra fancy, fancy, prime, choice, good, medium, fair, plain, common
Heavy heifers.....	Extra fancy, fancy, prime, choice, good, medium, fair, plain, common
Stags.....	Choice, good, medium, plain, common, light, thin
Cows:	
Kosher.....	Prime, choice, good
Butcher.....	Choice, good, fair, plain
Cutter.....	Good, fair, plain
Canner.....	Good, fair, plain, common, poor
Bulls:	
Butcher.....	Prime, choice, good, medium, plain
Bologna.....	Choice, good, medium, plain, common, light
Veals:	
Selected.....	Prime, choice
Medium.....	Choice, good, fair, poor
Heavy	Choice, good, fair, poor

Extra fancy heifers are females, showing very light development in the essentially feminine characteristics; that is, they are trimmer of middle and smoother through the hocks and rump than usual, being prime in other particulars. They are usually very well bred and extremely uniform. Fancy heifers are similar to extra fancy, except that they are slightly less uniform, and usually a little lighter. Kosher cows are of good size, and well enough finished to make a thick fore-quarter for the Jewish trade. The quarter is cut off behind the fifth rib, and thickness of meat is essential.

Prime selected veal calves weigh from 135 to 165 pounds and are fat. Medium weight veals run from 110 to 150 pounds, the better grades being heavier, and the poor to fair veals average from 110 to 125 pounds. Heavy veals weigh 200 to 350 pounds, the plain skim milk calves in this class ranging from 200 to 300 pounds.

Feeder and Stocker Grades

Feeders and stockers are graded in a manner similar to finished cattle, but the determining factors are based on



Choice Medium-Weight



Medium to Good



Choice



Common Medium-Weight



Common

Courtesy Armour's Livestock Bureau

Figure 28. Grades and Classes of Calves

their ability to gain rather than their ability to kill. Feeder steers have been given the following classification by packer authorities:⁵

GRADE	WEIGHT (Lbs.)	BREEDING	TYPE
Fancy selected . . .	1,000-1,150	Nearly pure beef blood	Uniform, beefy
Choice	1,000	High in beef blood	Beefy
Good	900	One or two crosses pure bulls	Above average
Medium	850- 900	Mixed	Below average
Fair	800- 850	Some cold blood evident	Rougher, plainer

Other classes of feeders and stockers grade as shown in the next table, their differences between grades approximating that shown in the foregoing:

CLASS	GRADES	WEIGHTS (Lbs.)
Yearling steers	Choice, good, fair, common	500- 650
Stocker steers	Fancy selected, choice, good, fair, common	600- 800
Feeding heifers	Yearlings, choice, good, fair, range	600- 800
Feeding cows	Choice, good, fair, plain	650- 850
Springer cows	Good, fair	750- 900
Springer heifer	Good, fair	700- 800
Feeder bulls	Choice, good, fair	800-1,100

In the spring of 1920 feeder steers brought about 25 to 50 cents per hundredweight more in the corresponding grades than yearlings, due to their ability to finish faster, while stockers sold about a dollar lower than feeders. Heifers in corresponding grades brought from 75 cents to a dollar more than cows, while feeder bulls were generally listed about 25 cents above feeder cows.

⁵ The tentative classification of feeder and stocker cattle developed by the United States Bureau of Agricultural Economics in 1922 is given for purposes of comparison, and is as follows:

I. Feeders:

1. Heavy Weight Feeder Steers (1,000 lbs. up): selected, choice, good, medium, common.
2. Light and Medium Weight Feeder Steers (750-1,000 lbs.): selected, choice, good, medium, common.
3. Feeder Heifers: choice, good, medium, common.
4. Feeder Cows: choice, good, medium, common.
5. Feeder Bulls: choice, good, medium, common.
6. Feeder Calves: selected, choice, good, medium, common.

II. Stockers:

1. Stocker Steers: selected, choice, good, medium, common.
2. Stock Heifers: choice, good, medium, common.
3. Stock Cows: choice, good, medium, common.
4. Stock Bulls: choice, good, medium, common.
5. Stock calves: selected, choice, good, medium, common.

Lard and Bacon Hog Types

By different methods of breeding and feeding for certain market requirements two distinct types of hogs have been developed.⁶ These are the lard type and the bacon type. Hogs of the lard type far outnumber those of the bacon type in the United States. The former is often called the American type of hog, because in this country it has reached its highest development. The people of the United States generally prefer this type of hog, and in consequence the majority of feeders produce the rapid-fattening, heavily fleshed lard type. Corn, which is largely responsible for this type of hog, is deficient in protein and ash, and has a tendency to produce fat at the expense of lean meat.

The bacon breeds of hogs, Tamworth and Yorkshire, are not raised in very large numbers in the United States. Where corn is not relied upon as the principal grain for hogs, the production of choice bacon is more general than in the Corn Belt, even though the so-called "lard" breeds are used.

Breeds of Lard Hogs

The lard hog is low set and compact, with a very wide and deep body. The shoulders are full, although not coarse, with rounded hindquarters and hams carried out straight to the root of the tail and thickly fleshed down to the hock. The flesh is thick and evenly distributed throughout the body. Formerly, very heavy hogs were in demand, but at present pigs weighing from 175 to 250 pounds ordinarily command the highest prices. The lard hog does not show the quality and density that prevails in the bacon breeds.

The principal breeds of the lard type are the Poland-China, Berkshire, Chester White, and Duroc-Jersey. Ranked according to their numbers coming to the markets, the breeds of swine most largely raised in North America at the present

⁶ Ashbrook, F. G., "Breeds of Swine," U. S. Department of Agriculture, Farmers' Bulletin No. 765 (1918).

time are the Duroc-Jersey, Poland-China, Berkshire, and Chester-White. Of these, the Berkshire is directly of English origin, while the other three may be termed American breeds. The Poland-China hog originated in the Miami Valley of Ohio, chiefly in Warren and Butler Counties. At present there are two distinct types in this breed, the large type Poland-China, which is a sizable, prolific, heavy-boned animal, and the so-called medium type, which is less popular with the producers.

POLAND-CHINA HOG. In general appearance the Poland-China is compact, symmetrical, full and round, smooth, and inclined to massiveness in build. The color is black with six white markings on the face, feet, and tip of tail. The face is practically straight and the ears droop about one-fourth, or one-third from the tip. The body is smooth throughout with thick, broad, heavy sides, which are somewhat short, but very deep. The hindquarter is thickly fleshed, and the hams are very wide and deep, extending well down on the hocks. The legs are short and the bone fine.

BERKSHIRE BREED. The Berkshire is one of the oldest of the improved breeds of swine. It is attractive in appearance, a little above medium size. The color is similar to the Poland-China, black with white on feet, face, and tip of tail. The face is medium in length and sharply dished. The ears are erect and slightly inclined forward. The Berkshire has good width and depth of body. The back is broad with good spring of rib and good thickness through the rump and hams, and for this reason the Berkshire is well adapted for bacon production, although sometimes the shoulder is too heavy, and the side lacks the desired length for prime bacon sides.

DUROC-JERSEY AND CHESTER-WHITES. Duroc-Jersey hogs were first bred in New Jersey and other Atlantic states. This breed from its early days has been noted for docility, fecundity, and hardiness. It is similar to the Poland-China in size and conformation.

The Chester-White hog originated early in the nineteenth century in Chester County, Pennsylvania, and is now widely distributed in the United States. This breed is moderately long, thick, and deep, possessing strong bone, but somewhat loosely coupled. The original Chester-Whites were dished slightly in the face, but the dish has disappeared and the present-day animals possess straight faces with rather long snouts. In conformation the Chester-White is long, but not so deep in body as the Poland-China. The legs are short, but some individuals may lack strength in the pasterns. The color is white and the hair has a tendency to be wavy.

HAMPSHIRE HOG. The Hampshire is said by some to have originated in the English county of that name, and was introduced into the United States during the first half of the last century. This breed is sometimes classed between the fat, or lard hog, and the bacon type. The Hampshire has made rapid progress of late years, but in comparison with the older established breeds the number in any one state is not large, because the breed has only recently come into prominence.

The most characteristic feature of the Hampshire is the white belt around its body, including the shoulder and front legs, while the rest of the body is black, some individuals being entirely black. In general appearance the Hampshire is rather upstanding, with a body not very broad, but deep, jowls light, head small, snout rather straight and medium in length, shoulders smooth and well set, back strong and arched, hams deep and broad, but not very thick.

Description of Bacon Hog Type

In conformation the bacon type of hog is very different from the lard type, being longer in leg and body, with less width of back, and lighter in the shoulders and neck. On first sight this type is lean and lanky in appearance. The spring of rib in a bacon hog is very characteristic. The side of the hog

is used for the production of bacon, and for that reason much emphasis is laid on the development of the side. The bacon hog possesses great length and depth of body and is very smooth throughout. Large, heavy hams are not desirable on the bacon hog, and the hams should be smooth and taper toward the hock.

TAMWORTH BREED. Of all the breeds, the Tamworth is probably the purest. In general outline, Tamworths are long, smooth, and fairly deep, having a moderately light fore end and deep ham. The snout is rather long and pointed, the neck is light and muscular, the jowls are light, the ears are large and usually upright, but often inclined forward. Although the legs of the Tamworth are long, they are strong. The color is red, varying from light to dark. A "Gorden-red hair on a flesh-colored skin, free from black," is preferred. The bacon is of exceptionally fine quality, well mixed with lean, and fine grained.

Hog Market Requirements

Regarding the market requirements for hogs, it is first desirable to know how they are classified. The important factors are weight, condition, quality, form, and sex,⁷ but it is not possible to lay down a hard-and-fast method by means of which every hog can be classified as with a scale and yardstick, as the exigencies of the market often cause the shifting of the lines separating the different classes, and the grading is easier in a market where hogs are scarce than where they are plentiful. Permanent changes in market demands will cause a change of classification, as will be shown. However, that used at present on the Chicago market, and which will apply with certain modifications to other markets, is from the packer point of view about as follows:

⁷ This discussion of market classes from the viewpoint of the packing industry is based on "Progressive Hog Raising," by Edward N. Wentworth, Director, Armour's Livestock Bureau.

Hog Classification by Packers

1. **PRIME HEAVY HOGS.** These are hogs weighing from 300 to 400 pounds. As the name signifies they must be prime in condition, form, and quality, and so only certain of the hogs that are of this weight will fall in this classification. Prime heavy hogs are usually barrows, as they outdress and outyield sows. These hogs usually run from ten months to a year and a half old, and they are both older and heavier than the average of the hogs now being marketed. There are not many of this class on the market today.

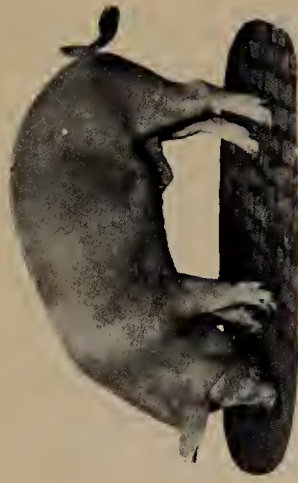
2. **BUTCHER HOGS.** This is the most popular class of hogs. Butcher hogs are the hogs of the pork chop, the ham, and the bacon. They must be of proper weight for the butcher block and have sufficient quality and proper condition. Butcher hogs must be well-finished young stock that will weigh from 200 to 300 pounds. They are divided into three subclasses, as follows: heavy, 260 to 300 pounds; medium, 200 to 260 pounds; light, 150 to 200 pounds. There are variations of grade in each of these subclasses, but nothing that will grade less than a good hog will find its way into the butcher class.

3. **PACKING HOGS.** This is the next largest class. Into it fall the heavy hogs that do not have the quality to grade as prime hogs, and the lighter weight hogs that are not good enough for butchers. This class, in fact, constitutes a place for everything that is thrown out of the classes above, except the few that are even too coarse for packing hogs. These latter are thrown out as roughs. This class of packing hogs is subdivided as follows: heavy, 275 to 350 pounds, medium, 225 to 275 pounds, mixed, 200 to 300 pounds, making the approximate limits for the class from 200 to 350 pounds. These packing hogs usually go into the coarser grade of meats and are graded as good, common, and inferior.

4. **LIGHT HOGS.** This class is principally made up of young, light-weight barrows, or clear sows. The type has grown in popularity in recent years from the viewpoints of



Medium Butcher
(Weight 250 lbs.)



Bacon Type
(Weight 190 lbs.)



Light Butcher
(Weight 220 lbs.)



Packing Sow
(Weight 300 lbs.)



Heavy Butcher
(Weight 300 lbs.)

Courtesy Armour's Livestock Bureau

Figure 29. Grades and Classes of Hogs

both hog raiser and packer. Growers make better profits from feeding hogs not to exceed this weight. On some markets hogs of 200 pounds and under now constitute by far the greater part of the receipts. The growing demand for fancy English meats and breakfast bacon makes it desirable to secure an even greater increase in the proportion of these hogs, rather than those of heavier weights. The weight limits of the class are from 130 to 200 pounds and it is subdivided as follows: bacon, 160 to 200 pounds, light lights, 130 to 160 pounds, light mixed, 150 to 200 pounds. Of these, the bacon hogs have the most quality. Good, common, and inferior pigs are found in light lights and light mixed.

5. MARKET PIGS. These pigs weigh from 50 to 130 pounds, and are lighter than the light lights. They grade as choice, good, and common, and often have much the same round form as a finished hog. Generally speaking, the demand is not very great for this class. They should be held back a few months and then sent to market in the form of mature hogs.

6. ROUGHS. These hogs, called "roughs" or "throwouts," are the ones that are too coarse to grade at all. They are lacking in condition, form, and quality, are "rough" in every way, and consequently sell at the lowest price.

7. STAGS. These are boars that have been castrated. While they sell with a dockage of 80 pounds, due to the fact that they are very wasteful in dressing, the price for them is usually good, so that they pay out well. It certainly is better to send stags to the market than boars, as is shown below.

8. BOARS. Boars are not usually marketed until their days of service are over and they are old and coarse, but they are practically unmerchantable. A large majority of the boars that come on the market are condemned by the government inspectors. They then bring but fertilizer price to the owner, and boars that do pass inspection sell at a very low price.

9. ROASTING PIGS. At certain times of the year a few

young pigs weighing from 15 to 30 pounds come on the market. They still contain much of the pig fat and water. However, they are more generally handled by the poultry commission men. The same arguments apply to these as to "market pigs" described above.

10. DEAD HOGS. Hogs which arrive dead in the car will bring a fertilizer price if they weigh 100 pounds or over, but if they weigh less they have no value.⁸

What Hogs the Packer Desires

The question now arises as to which of these classes and grades the public, and, therefore, the meat packer, wants. Such wants are governed by the demand of the domestic consumer, or the export markets, which call for entirely different cuts than those used in this country. The packer must buy hogs that will produce the cuts for which there is the greatest demand and which also yield a suitable proportion of lard.

The four principal domestic cuts for which there is this demand are shoulders, loins, and Boston butts, which are fresh products, and hams and bacon, which are cured. When filling export orders it is necessary to select hogs of the best quality, built along the light and rangy order, which permits of a long ham and belly. The most important of these cuts are the Cumberland and Wiltshire, which necessitate using practically the whole side of the hog. The manufacturing of

⁸ The tentative classification of hogs which has been developed by the United States Bureau of Agricultural Economics is given for the purpose of comparison and is as follows:

A. Killing Grades:

I. Butcher and Bacon Hogs:

1. Heavy Weight (250 lbs. up): choice, good, medium.
2. Medium Weight (200-250 lbs.): choice, good, medium, common.
3. Light Weight (150-200 lbs.): choice, good, medium, common.
4. Light Weight (130-150 lbs.): choice, good, medium, common.

II. Packing Sows: smooth (250 lbs. up), rough (250 lbs. up).

III. Boars.

IV. Stags.

V. Pigs (130 lbs. down): choice, good, medium, common.

B. Stock Pigs:

1. Heavy Weight (100-130 lbs.): choice, good, medium, common.
2. Medium Weight (80-100 lbs.): choice, good, medium, common.
3. Light Weight (80 lbs. down): choice, good, medium, common.

export cuts, therefore, utilizes hogs which are also desirable for lighter averages of cuts used in the domestic markets.

Hogs weighing from 200 to 260 pounds are most desirable for packing purposes, as they will produce cuts of all merchantable averages and, if properly fed, will always yield well for lard. Hogs weighing from 175 to 200 pounds are the most desirable weights, from which are selected the products suitable for export and lightest averages of cut.

Analyzing this further, the packer wants good, light, and medium butcher hogs. Of course, all of these prime hogs find their way into butcher cuts. On the other hand, a question might be put as to why packing hogs cannot be used for loin cuts, since many of the medium and mixed packing hogs, with weight limits of 225 to 275 pounds and 200 to 300 pounds respectively, will at least fall into the proper weight limits. The fact is that these packing hogs are deficient either in condition, form, or quality, or in all of these factors, and so cannot be cut up into loins and fancy clear bellies for bacon.

Butcher Hog Best to Raise

In addition to being the hog the packer wants, the butcher hog, weighing from 200 to 260 pounds, is the cheapest and best hog for the farmer to raise. Dr. W. A. Henry, in his "Feeds and Feeding," gives a compilation of over 500 American feeding trials with more than 2,200 hogs. The amount of feed required for each of the various weights per 100 pounds gain is as follows:

WEIGHT OF HOGS (Lbs.)	POUNDS FEED FOR 100 LBS. GAIN
100 to 150.....	437
150 to 200.....	482
200 to 250.....	498
250 to 300.....	511
300 to 350.....	535

This test shows that for the amount of feed eaten the largest returns are secured from light-weight hogs, that is, the amount of feed required for a pound of gain is smaller in butcher hogs than in heavier varieties, and increases with advancing weight. From the farmer's standpoint, there is greater profit in putting hogs on the market at 200 to 260 pounds than in carrying them to a greater weight.

Breeds of Sheep

There are 30 breeds of improved sheep that have been brought to fixed types as adapted to the needs of their native homes. Of these, 12 are well established in the United States and a number of others are gaining in popularity. The better known breeds can be grouped into three classes, each class having its own general qualities.⁹

The medium-wool class includes Southdowns, Shropshires, Hampshires, Oxfords, Dorsets, Cheviots, Suffolks, and Tunis, the last two not being numerous. The long-wool class includes the Cotswold, Leicester, and Lincoln breeds, and the Romney Marsh, which is not as well known in America as are the others. The fine-wool class includes the American Merino and the Rambouillet. The various Merinos, once known by numerous names, are now grouped into three types, A, B, and C.

MEDIUM-WOOL BREEDS. The following breeds are included in the medium-wool class: Southdown, Shropshire, Hampshire, Oxford, Suffolk, Dorset, Tunis, and Cheviot. The first five are collectively referred to as "down" breeds, because of the nature of the country in which they were developed. This country is one of ranges of hills, or "downs," as they are called in southern England. The "down" breeds have all been bred primarily for mutton, with special emphasis upon some useful character considered necessary for the style of farming and the markets of the various counties, or shires,

⁹ Marshall, F. R., "Breeds of Sheep for the Farm," U. S. Department of Agriculture, Farmers' Bulletin No. 576.

from which most of the breeds take their names. The face and leg color of most "down" breeds is of some shade of brown or black, and the fleece occupies a middle position between the length and coarseness of the long-wools and the extreme fineness and density of the fine-wools. While there are breed variations in fineness, length, and density, the fleece is always close and dry enough to furnish excellent protection.

BREEDS GOOD FOR MUTTON. The Southdown is the oldest of the medium-wool breeds and on that account flocks of this breed are strikingly uniform in their qualities and appearance. Their body conformation is the ideal one for mutton and in the estimation of the market no breed surpasses them. They are readily recognized by their very blocky, low-set appearance. The breadth of the back, thickness of loin, with the plumpness of the thighs and twist, are breed points of greatest value. The head is short and broad, and the eyes prominent. The face is sometimes partly covered with wool and varies in its color from brown to mouse color, or very light gray. The legs show the same color as the face.

The Shropshire is the most widely known and bred of the "down" breeds in America. In body it is intermediate between Southdown and larger breeds. In weight, length, and fineness of fleece the Shropshire ranks high, and the proceeds of the wool are a very important part of the income from the flock. In breeding for a valuable fleece along with mutton qualities the Shropshire breeders prefer sheep that are well wooled up over the poll, below the eyes, and on the ears.

The strong point of the Hampshire is the rapid rate of growth in the lambs when well fed. This quality is associated with unusual size, the breed being the largest of the medium-wool class. In appearance the Hampshire is large framed, rather tall, heavy boned, rugged, and somewhat coarse looking. Apart from the size, the head is the most distinctive feature. This is large, strong in the nose in both sexes, black in color, and the ears are large and seldom erect.

The Oxford is a cross between the Hampshire and Cotswold. Being a very large and heavy breed, the lambs grow rapidly when well fed, and can be matured early, though not so early as those of some of the less growthy breeds. The typical Oxford is large framed and heavy boned. The appearance of size is added to by the extra length of wool, though some run to the shorter, more compact style of fleece. The Dorset is of the medium-wool type, but is not a "down" breed. Both rams and ewes have horns. The faces and legs are white. The type is one of a little larger and coarser frame, with less compactness than is found in the smaller down breeds.

MOUNTAIN MUTTON SHEEP. The Cheviot is a mountain breed. It is accustomed to grazing over rough places and is very active and alert, both in appearance and behavior. It is vigorous and hardy, and capable of producing mutton upon lands unsuited to other breeds. This stock is distinguished by its short and very stocky appearance, which is due in part to the length of the fairly dense fleece. There are no brown markings, and the bare white face with the strong nose, prominent eye, and erect ear have gained the Cheviot many admirers.

The Suffolk is a "down" breed. The ewes are hardy, very prolific, and heavy milkers. The face and legs are bare, dark in color, and the belly wool is light. The long-wools, raised chiefly for mutton, are the largest breeds of sheep. All of them are large-framed, square-bodied sheep, with very broad backs. Their fleece is open or loose as compared with the fine wools and middle wools, coarser and very long. The typical Cotswold is a big-bodied, rather tall sheep, of stylish appearance. The color of the face, ears, and legs is gray. The wool extends up over the poll and hangs in ringlets of varying length over the face. All over the body the wool hangs in long wavy curls that do not show in the same way on other breeds. Generally the thigh wool is hairy, though the fleece as a whole is bright, and on account of having no



Fed Western Aged Lamb



Native Lamb



Native Ewe



Western Lamb



Western Ewe



Cull Lamb

Courtesy Armour's Livestock Bureau

Figure 30. Grades and Classes of Sheep

excess of oil, is light in shrinkage and sells well. The Lincoln is shorter and more compactly built than is the Cotswold, while the Leicester is very easily distinguished from the other long-wools by its lean and strong face. The nose is decidedly Roman and the head is bare of wool from the ears forward.

MERINOS NOT BRED FOR MUTTON. All fine-wool sheep are descendants of earlier Spanish stock. The American Merinos have been bred nearly altogether for wool. Some breeders of the Delaine, or C type Merino, have bred to some extent for a mutton carcass in addition to fineness and length of wool. In the case of the Rambouillet there has been a greater effort to improve the mutton qualities. A common characteristic of all Merinos and Rambouillets is the fineness of the wool. It is for this quality they have been bred, and while there are variations, there is as much of uniformity in fineness as in any one character of any class of sheep. This fineness is an important quality of wool, although its value in the market varies from time to time.

The following are the different classes and grades of sheep quoted at livestock markets as being standard according to the current packer point of view:¹⁰

¹⁰ The tentative classification of sheep and lambs which has been developed by the United States Bureau of Agricultural Economics is given for purposes of comparison and is as follows:

A. Killing Grades:

I. Lambs: *

1. Light Weight (80 lbs. down): prime, choice, good, medium, common, cull.
2. Medium Weight (80-90 lbs.): prime, choice, good, medium, common.
3. Heavy Weight (90 lbs. up): prime, choice, good, medium, common.
4. Spring Lambs: prime, choice, good, medium, common, cull.

II. Yearling Wethers:

1. Light Weight (90 lbs. down): prime, choice, good, medium, common, cull.
2. Medium Weight (90-100 lbs.): prime, choice, good, medium, common.
3. Heavy Weight (100 lbs. up): prime, choice, good, medium, common.

III. Wethers: prime, choice, good, medium, common, cull.

IV. Ewes: prime, choice, good, medium, common, cull.

V. Rams: good, medium, common.

B. Feeder Lambs and Sheep:

1. Feeder Lambs: selected, choice, good, medium, common.
2. Feeder Yearlings: choice, good, medium, common.
3. Feeder Wethers: choice, good, medium, common.
4. Feeder Ewes: choice, good, medium, common.

C. Breeding Ewes:

1. Yearlings and Twos: selected, choice, good, medium, common.
2. Threes and Over: choice, good, medium, common.

* On and after June 15, 1922, all offerings born in the spring of the previous year are classified as yearlings and those in the current year as lambs.

Good to choice lambs
Fair to good lambs
Common and cull lambs
Good to choice yearlings
Fair to good yearlings
Good to choice wethers
Fair to good wethers
Good to choice ewes
Fair to good ewes
Culls and common ewes
Breeding ewes
Feeding lambs

CHAPTER XXIII

METHODS OF LIVESTOCK FINANCING

How the Present Methods Arose

Financing problems in the cattle industry arose with the impetus given by the opening of the territory west of the Mississippi. Both the industry itself and the financing methods employed were for a long time chaotic. The cattle were Longhorns, wild and inferior. The ranches were unfenced, and "rustling" was frequent. Heavy losses occurred due to insufficient water in summer and lack of feed in winter. Little discrimination was exercised in making loans. Finally the ranges became overstocked, and for several years after 1895 cattle raisers' losses were such as to render them unable to repay their loans. Many commission houses which had advanced funds failed and as a result cattle paper became very unpopular.

Since about 1900, however, conditions have changed. As one writer has said:

While pasture lands have decreased to a pitiful fraction of their former size, the transition has brought system and stability to the cattle industry. The ranches are now practically fenced, the cattle are an improved type, disease is well controlled, and "rustling" is over. Water is supplied by engines or artesian wells, and adequate feed is stored for the winter. Skilled executives trained in approved business methods administer the affairs of the modern ranch. Cattle raising has become a specialized industry.

With this change in the character of the industry has come a change in financing methods and agencies.

The livestock industry¹ is now financed by three groups of organizations: cattle loan companies, livestock commission companies, and banks which lend money on livestock. The commission companies limit their loans for the most part to feeder loans, and then only with the object of increasing their commission business. Banks make all classes of loans, but the legal restrictions on the amount which they may loan to one individual greatly curtail their advances. The banks, whose capital and surplus is such that a 10 per cent maximum to one borrower would not prove a handicap, are located in the larger centers, and so are not in a position to make the necessary investigation to protect themselves against loss. Therefore, they buy cattle paper rather than lend in the first instance on cattle. However, an organization possessing facilities for local supervision of loans is necessary. Moreover, such an organization must possess sufficient resources to enable it to finance a considerable volume of business. The cattle loan company, not subject to legal loan restrictions, and obtaining its funds through resale of the loan it makes, fills this place. Some companies are organized independently, but as a general rule, especially in the case of the larger ones, they are affiliated with some large livestock national bank, their stockholders, directors, officers, and headquarters being usually identical. In such cases, the cattle loan company carries on those portions of the business which it would be extremely difficult, if not impossible, for a bank to handle.

Size of Loan Companies

In 1918-1919, when cattle loan companies were carrying the largest amount of loans on record, the volume handled by

¹ The following survey of the operations and methods of cattle loan companies is based in large part upon a study by Mr. Victor A. Newman, prepared at the Wharton School of Finance and Commerce, of the University of Pennsylvania, and entitled "Methods of Analysis of Cattle Loan Banks and Companies," Kansas City, Mo., 1922.

Valuable material is given in the Federal Reserve Bulletin, October, 1922, prepared by the Division of Analysis and Research of the Federal Reserve Board, and supplemented by data supplied by leading bankers and others associated with the industry in the principal livestock centers. For a short list of references, see general bibliography.

the individual company ranged from \$500,000, in the case of the smaller companies situated at packinghouse centers, to approximately \$15,000,000 in the case of one or two companies. Since that time all companies have greatly reduced their loans, some of them as much as 50 per cent or more. This has been due to the decline in livestock prices, the difficulty in placing paper as a result of general financial conditions, and also the realization by certain companies that their loans had been too large in comparison to their capital investment.

In this connection it is interesting to note that some authorities believe a well-managed, conservative cattle loan company can lend ten to twenty times its capital and surplus. The larger companies, it is true, have felt that their loans should not greatly exceed ten times their net worth, but in some cases, especially with the smaller companies, a much larger ratio has been lent. The average company, it has been said, places loans amounting to from \$4,000,000 to \$5,000,000 a year.

The capital and surplus of the individual company range in a general way from \$25,000 to \$750,000. The independent companies, it is generally stated, are smaller than the affiliated companies, although there are a few throughout the country that are as large as are the affiliated ones. The best companies are incorporated.

Location of Cattle Companies

By far the greater number of the companies are located in the principal packing centers. The livestock business is concentrated in these centers. Stockmen naturally seek funds at such points, while companies located there can inspect purchased cattle as well as watch the marketing of stock. Developments in the industry also center at these points. Some other large companies are located on the Pacific Coast and in New Mexico.

The territory covered by the individual company depends upon the size of the company and the policy it pursues. Certain companies are willing to make loans at a greater distance from the head office than are others. In a general way, the territory naturally tributary to the most important centers is as follows:

Chicago: The Corn Belt and the Northwest as far as western Idaho.

Kansas City: Kansas, Oklahoma, Texas, and parts of New Mexico and Colorado.

East St. Louis: Southern Illinois, Missouri, Oklahoma, and Texas.

St. Paul: The Northwest as far as Montana.

Omaha: Nebraska, South Dakota, Wyoming, Montana, and part of Iowa.

St. Joseph: Kansas, Texas and eastern Colorado.

Sioux City: South Dakota, and parts of Iowa, Nebraska, Minnesota, and Wyoming.

Oklahoma City: Oklahoma, Texas, and New Mexico.

Denver: Colorado and part of Wyoming.

El Paso: Parts of Texas, New Mexico, and Arizona.

Salt Lake City: Utah and Idaho.

Los Angeles: California and part of Arizona.

Portland: Washington, Oregon, Idaho and parts of California, Utah, Nevada, to as far east as Nebraska and South Dakota.

Types of Loans

Loans are made on cattle and to a lesser extent on sheep. The present discussion will consider chiefly cattle loans. These may be divided into feeder loans, stocker loans, and dairy loans. Feeder loans have been defined as "loans made on beef steers which are ready to go into the last stage of feeding prior to their sale as finished beef"; in other words, funds are advanced for the purchase of stock to be fattened on the feed which the borrower already has, or which he will buy out of his own funds. Stocker loans are further subdivided into those on breeding cattle, those on young steers or heifers which will not be ready for the market for a year or more, and so-called "summer loans." Advances are not made ordi-

narily on registered breeding herds because of their high value and the great attendant risk. Summer loans are made only in the West to enable the borrower to buy cattle for grazing during the summer. The rancher is able to graze more stock than he can feed in the winter, and it is expected that in the fall he will sell all those which he cannot feed. The cattle increase in weight and therefore in value, almost as rapidly on grass as in the feed lot. Dairy loans form a negligible part of the business of cattle loan companies, as they are dissimilar in many ways from the ordinary types of cattle loans, since they run for relatively long periods and are usually payable in monthly instalments from the proceeds of sale of butter fat, and local banks usually care for them.

Feeder Loans Desirable

Feeder loans are usually considered as furnishing the most desirable type of paper. They are ordinarily for a shorter period and the cattle are at all times more marketable and are not subject to the same vicissitudes of weather, disease, and accident as are stockers. Some authorities feel that such loans should not be made by cattle loan companies, but should be taken care of by commercial banks. Certain companies, however, do take a large amount of this paper, and at the same time exclude a great many stocker loans by avoiding summer and open range loans, because of the danger arising from the difficulty of making the careful and continuous check-ups which are necessary in order to keep losses at a minimum. On the whole, the types of loans handled by any one company depend upon the territory which it covers.

What Determines Type of Loan

The policy adopted by the individual company will have important bearing on the type of loan handled. For example, feeder loans have usually been considered the most desirable type of paper, owing to better marketability of the security.

Some cattle loan companies, however, believe that feeder loans are not a proper type for the cattle loan company and that they should be taken care of by the country banks. Some other companies avoid open range loans as being dangerous because of the difficulty of the careful and certain check-up necessary for holding down losses. This excludes a great many stocker loans from consideration by some companies.

Apart from these special instances, the kind of territory in which loans are made will be the primary cause for the predominance of one or the other type of loan with various companies. Thus the majority of feeder loans are made by companies located in or near the Corn Belt at Chicago, East St. Louis, Omaha, and Kansas City, and also at the western edge of the cattle country at Los Angeles and Portland. But many of these companies will have more stocker than feeder loans, and as companies in other centers will have but a negligible number of feeder loans, it is clear that stocker loans will be easily in the majority among the loan companies as a whole.

Sources of Cattle Paper

The companies make their loans in one of three ways: through their country correspondents, through the commission companies, or direct to the cattlemen. Many large loans come direct, but probably as many of the smaller are made with a local bank as intermediary. The percentage of the total loans that are made through commission companies ranges up to 15 per cent, but the latter figure may be exceeded in the case of companies actively associated with commission firms. Difference of opinion exists, however, as to the merit of such loans. Some hold that commission firms are not as careful in lending as they should be, because such loans are made by them in order to increase the number of cattle which are sold through them and thus add to the volume of their commission business. Their loan procedure is, nevertheless, very similar to that of the cattle loan companies, and although the margin

required is smaller in some cases, the commission firm assumes liability for payment by indorsing the paper. The cattle loan companies also indorse the paper.

Loans Through Country Banks

Several methods are followed in placing loans through country banks. Some loans are, of course, too large for such institutions to handle at all. In this case, while the country bank receives a commission for negotiating the loan (this commission being paid by the cattle loan company), the loan is made directly by the loan company to the cattlemen. In practically all other cases either the country bank indorses the paper, or it is indorsed by the officers and wealthiest directors. The latter type of indorsement in the case of country banks is often the most valuable, and at the same time keeps down the amount of money the country bank must show on its books as having been borrowed. The volume of paper coming from this source seems to depend on the policy of the cattle loan officers, because instances may be found where of two cattle loan companies in the same city, one may make only 20 per cent of its loans through correspondents and the other 80 per cent through the same source.

There is a difference of opinion among cattle loan men as to whether it is preferable to make loans direct or through correspondents. Mr. Newman, in his analysis,² sums up the situation as follows:

It is very probable that the cattle loan company can get what it wants through the country banker when he has endorsed the paper, but in cases where the correspondent has merely been the intermediary between the borrower and the cattle loan company we would be likely to find matters standing as follows: The cattleman is very likely to look to his own bank as the supervising authority, and if it came to a showdown between the cattleman and the loan company, the country banker would be very likely to reason that it would be less hard to change his

² See note 1.

city correspondent than to lose a valuable customer. It must be concluded that the extent to which an intermediary between borrower and lender is valuable depends entirely upon whom the intermediary happens to be. If the country banker chanced to be of the type that would make the cattle loan company's interests his own, well and good; but if he is not, the preferable plan would be to make loans directly to the cattlemen so that the loan company could be in complete control.

Methods Used in Handling Cattle Paper

All possible care is taken by a cattle loan company in gathering information and in its varied check-ups. It is probable that in no other line of credit work is the information regarding the borrower, the security, and other vital matters made as full and accurate.

First of all, cattle loan companies emphasize the importance of doing business with the right kind of men, since the company is doing business as a rule not with a large firm or corporation, but with an individual. For that reason the personal element, so important in the granting of credit, becomes of special significance in the making of cattle loans. "The brand on the man is worth more than the brand on the cattle."

Four blank forms are used by cattle loan companies in obtaining information on prospective loans. These forms are the application, financial statement, inquiry, and inspector's report, and the filling out of these forms separately or together is a universal requirement. When the application is a separate form, the information furnished deals with personal particulars regarding the applicant, the purpose of the loan, information as to interest, length of maturity, etc., details as to the security offered, and sometimes other information as to the business practices of the applicant. Sometimes these are incorporated in the financial statement which is a sworn one, but when the application and financial statement are consolidated these particulars are often omitted altogether, and such consolidation avoids duplication of information.

The cattle loan companies also endeavor to obtain accurate information from other sources than the borrower. All large cattle loan companies and most of the smaller ones use "inquiries," as they are called, which are sent out through their credit departments to verify the information given by the applicant for loans. These are addressed to bankers, merchants, and cattlemen, as well as to the county recorder or similar official, who, for a small fee, gives an abstract of the mortgages upon the applicant's property, filed or recorded in his office. Efforts are made by the companies to establish relations with banks in the territory they cover, upon which they can depend for information.

Importance of Inspection

The cattle loan company, however, attaches the greatest importance to inspections. Every company has at least one regular inspector, although some depend upon local men to make a part of their inspections. The local inspector is either a cattleman or a country banker. The latter is usually employed only to inspect loans which have not been taken through his bank. Considerable difference of opinion exists as to the value of the local inspector's work. Some companies state that it is not always as reliable as it might be. In most cases inspections are made before a loan is accepted, and at intervals of from three months to one year thereafter, varying with the company. Practically every company, however, makes it a practice to inspect each loan at least once a year (it will not run that length of time unless renewed at least once), and inspection may be made at any time, in case question arises as to the safety of the loan.

The inspection includes several matters. First, there is a count of the cattle covered by the company's mortgage. It is very difficult or almost impossible in certain kinds of open range loans to make a close count or inspection of cattle, except in the annual round-up, owing to the large areas over which

the cattle are scattered. This, it is claimed, the inspector sometimes fails to do. Most companies require a tally by class, number, value, weight, and brands. The latter is especially important, for the brand is the only means the company has of identifying its security. Further detailed information is required as to feed, range, and water, the general condition and appearance of the ranch or farm, and other data designed to verify that furnished by the applicant. Suggestions are also requested as to changes in the handling of the security. If cattle are purchased by the borrower in the center at which the company is located, the final inspection is easily made, and takes place at the same time as the purchase. If they are purchased elsewhere, an inspector is sent to the borrower's farm and, when they are delivered, he inspects them, to be sure they are the same cattle which he examined previously.

Conditions of the Loan

One of the most important and most common conditions which must be met before a cattle loan company will make a loan, is that it shall be the only lender to the applicant. Confusion would be endless if one company held a mortgage on 200 steers and another a mortgage on 100 belonging to the same owner. Each company could only identify its security if the brands were different, and this is in fact required before any company will loan to an applicant who has already borrowed with cattle as security. Furthermore, if an occasion arises which compels one of the companies to furnish money, a dispute is bound to follow as to which one should furnish the money. Large buyers of cattle paper, in many instances, will not take paper where the borrower is indebted to more than one company.

The company also often specifies that the borrower shall own his ranch. It believes the renter is not as steady or reliable as the landowner; it looks to a first or second mortgage on the ranch as something to fall back on in case the loan

becomes doubtful, while the rental of pasturage may prove too heavy a burden for the cattleman. Nevertheless, most companies will loan to renters under certain conditions. Some do it if the applicant has a long lease at a reasonable rental. In most cases, however, the deciding factor is the financial statement of the borrower, and the size of his net worth, especially in connection with feeder loans. His proved honesty and ability as a cowman is also a large factor.

Collateral

The loan is secured by a chattel mortgage upon the cattle, and often upon "all the right, title, and interest of the mortgagor in and to the pasturage, feed pens, feed troughs, and water privileges used in feeding said live stock." Two features of the mortgage may be mentioned. First, it covers "all of said property and all accretions and additions and increase thereof." The inclusion of any increase is vital in the case of loans on breeding cattle, for in such cases the increase is relied upon to furnish an additional margin of safety, as well as to provide funds to repay the loan when it is sold. Second, "the first party (the borrower) shall have no right to encumber said property in any manner whatsoever without the written permission of the holder of the note or notes hereinafter mentioned."

In addition to giving the lender a preferred claim upon the property, it protects him against removal or sale of the security by the borrower, and pocketing of the proceeds by the latter without paying off the loan. This is accomplished through a provision that any attempt to dispose of the cattle without the permission of the lender renders the note or notes immediately due and payable. Further, if the lender "shall deem itself insecure at any time" it may take possession of the cattle given as security, occupying such premises "where said live stock, cattle or chattels may be . . . and may use and occupy said premises and pasturage, feed pens, feed

troughs and water privileges of said first party for the purpose of feeding or caring for said live stock, cattle and chattels." This provision is necessary in view of the fact that unwise handling of cattle may result in a heavy loss in a short time.

Finally, the mortgage gives the holder the right to call for more security, to move the cattle with or without the consent of the mortgagor into another location which is more favorable, or even to take possession of the security and ship it to market if necessary to protect the mortgagee's interests. The mortgagee, of course, can follow the cattle after they change ownership, and each owner is in turn responsible to the holder of the properly recorded mortgage for the amount of the note thus secured. The original mortgagor may be prosecuted criminally. The mortgage is filed with the county clerk.

Co-operation with Cattle Raisers' Associations

The ease with which cattle may be disposed of is one of the reasons for the relation that exists between the cattle loan companies and such organizations as the Texas Cattle Raisers' Association, which is the best known and most powerful of all such associations. Nearly all of the cattle loan companies, except those operating in the northern ranges, are members of one or other of these organizations, and many companies urge their borrowers to become members. It is, of course, impossible for the loan companies to make membership compulsory for borrowers.

The value of the cattle raisers' associations to the cattle loan company lies in their knowledge of the movement of certain brands to market. They will notify the loan company which has loaned money on cattle bearing the brand, and they also employ brand inspectors outside the central markets. This serves to stop thefts and fraud of all kinds, and at the same time assists in the picking up of strays.

Checking Validity of Loans

This matter of checking the validity of loans and assuring the loan company that the money will be put to the use for which it was sought, is carried still further through the method used by the cattle loan companies as a rule, in putting at the disposal of the borrower the money borrowed: This method is through the use of the bill of sale draft or draft with bill of sale attached. This credit instrument may be used thus:

A feeder of cattle in Oklahoma, named A, wishes to buy steers valued at \$15,000 from B, a cattleman located in the same state. A has made arrangements with a loan company in Kansas City to lend him the full value of the steers. A would pay B for the cattle with a draft on the cattle loan company at Kansas City. On the reverse side of the draft is a bill of sale, by means of which B certifies to the sale of the steers to A, and a blank consignment which A uses to assign his interest in the cattle to the loan company.

Several other methods are used in place of the customary bill of sale draft. The borrower may simply be credited with the amount of the loan in the bank with which the loan company is so often affiliated. Another way in which the matter is worked out, is that when the local bank has attended to the direct handling of the loan, that institution may advance the money for the purchase of the cattle, being repaid by the loan company after the note and mortgage have been drawn up. If the cattle have been bought at any one of the large markets the loan company may make payment directly to the commission company which has made the purchase for the borrower.

Margins

There has been a great difference of opinion between companies with regard to margins and even concerning cases handled by the same company. In the case of feeder loans, the cattle loan company may require no margin whatever if

the borrower has plenty of feed and is financially responsible, but of course the full value of the cattle is not advanced in the case of every feeder loan. This is done only under very favorable conditions, and where companies sometimes follow this practice, they may at other times require margins of 10, 20, 30, or even 50 per cent in some cases. Each loan is considered according to the particular circumstances surrounding it. One company is said to require at least 15 per cent margin on feeder loans and other companies require at least 20 and some as high as 30 per cent.

For stocker loans the margin has always been higher than for feeder loans. In many cases the margin required has been higher on stocker loans with breeding stock as security than those made on young steers. The reason is that the feeder loan has always been considered more liquid because the stock is in a better condition for the market at all times. It is also because the increase in the value of full-fed steers is more rapid than the increase in the value of young steers not yet ready for feeding, or breeding stock which must depend upon the number of births for the increase in value. Therefore, minimum margin requirements of the various companies on stocker loans will vary from 10 to 40 per cent, the average being about 30 per cent. The maximum margin under any circumstances would be about 60 per cent.

However, no standard margin requirements exist. The borrower's financial statement, his competency, the condition of his ranch, feed, and pasturage, his habits, the location of the cattle, and the opinion of the lender regarding the future trend of the cattle market, as well as its present tendencies, will be considered. Probably, however, they will not all be considered in any one case.

Maturities

The period for which a cattle loan runs varies with the type of the loan. Feeder loans usually run from 2 to 4

months, with occasional loans up to 6 months, depending upon how nearly ready for market the cattle are. Stocker loans, however, from their very nature, run usually for 6 months. This is the maximum time for which cattle loan companies will make advances, but they may occasionally make loans with the understanding that they will be renewed, provided all conditions remain satisfactory. Renewals may occur from one to three or four times. The length of "steer loans" depends upon the period necessary to prepare the stock for market or for the feeder, but is usually less than for loans on breeding stock, which are paid off by the sale of the increase. The latter requires some time, ordinarily 18 months. The cattlemen may be carried from year to year, although the security may change when the loan is renewed through the sale of some cattle and the purchase of others.

Feeder loans are usually not renewed, for they are supposed to be made upon cattle almost ready for slaughter. During recent years, however, a considerable number of loans were renewed in the hope that the market might take a turn for the better, and thus enable the loan more nearly to pay out. Stocker loans, except where the stock is ready to be fed or marketed, usually require renewals. Many, however, will gradually be reduced, especially in the case of breeding loans. Renewals on stocker loans have also increased greatly since the fall in prices. The normal percentages of renewals of such companies, ranging from 50 to 75 per cent, have increased to 75 to 90 per cent.

Losses

Under normal conditions the losses of cattle loan companies have been negligible. Only one company covered showed as much as 1 per cent per annum, and this was a comparatively new organization operating in a territory stricken by drought shortly after its entrance into the cattle loan field. Others show annual losses of $1/25$ to $1/10$ of 1 per cent.

Recently, however, conditions have not been normal. In 1917-1918 there was a severe drought in a large part of the cattle raising region of the Southwest. The following winter, 1918-1919, was unusually severe and was disastrous to many cattle raisers. During the summer of 1919 the Northwest suffered a bad drought, which was followed by one of the coldest and snowiest winters ever known. Following on all these unfortunate circumstances came the huge drop in cattle prices.

While the losses due to drought and blizzard, fraud, and incompetency were not heavy, the break in prices bankrupted many stockmen, and consequently many of the cattle loan companies were experiencing in 1921-1922 the heaviest losses in their history.

The fundamental cause of the recent losses, apart from drought and blizzard, was the slackening of requirements on the part of some cattle loan companies during the period when money was easy, and it was somewhat of a task for the loan companies to maintain their usual volume of business. Some companies failed to demand proper margins, took less care in selecting borrowers, and consequently had more than the usual number who were incompetent or dishonest. Besides these factors there was a general flood of money into the cattle raising regions, which together with the sums added by unsound loan companies, resulted in overexpansion on the part of some cattle men and this to an extent which was beyond that justified by their financial position.

Methods to Prevent Loss

To prevent the recurrence of such losses there are certain methods that can be used by loan companies. Among them is the insistence on larger margins. Just at the present time, however, this is not easy, because the cattleman with much money to put into livestock is rare. As the cattle market has gone as low as it can, the only sources of loss are the normal

ones. Therefore, it may be good policy for the cattle loan companies to forego for the time being any higher margins until the cattle industry is again on its feet. The other method to prevent loss would be the requirement of an income statement, more careful inspections, and stoppage of overexpansion and speculation.

Rarely does the interest charge of cattle loan companies go below 6 per cent and in few instances below 7 per cent, while 8 per cent is not uncommon. Accordingly the profits of the company are decided to a great extent by the money rate in the eastern market where the larger proportion of the paper is sold. That is to say, as the eastern rates advance the margin of profit for the cattle loan company decreases. Under normal conditions the margin averages about 2 per cent gross, and the expenses range from 1 to 1½ per cent. The cost decreases as the size of the loan increases. Small loans could not stand the inspection expense, hence they are made by the local bank.

The Sale of Cattle Paper

Cattle loan companies make loans not to retain themselves, but to sell to others with the addition of the loan company's indorsement. The profit for the loan company is made in the difference between the rate at which the loan is made and that at which it is sold. On account of the nature of their organization the loan companies can hold only a small amount of paper themselves. It is essential, therefore, that a cattle loan company have a steady market for the paper it wishes to sell.

The market for the paper of any cattle loan company varies with the company and the city in which it does business, but the location of the company is usually the most important factor. For example, companies in El Paso, Oklahoma City, St. Joseph, and other places where they are not in a position to have a large number of country bank correspondents, sell from 90 to 100 per cent of their paper to eastern banks. This

is true of companies in Omaha, which although it does not have as much country bank business as Chicago, Kansas City, or St. Louis, has more than these other cities.

Cattle loan companies in Chicago sell the largest amount of their paper in that city or in the East. One St. Louis company sells about two-thirds of its paper in the East, one Sioux City company about three-quarters, a St. Paul company about 60 per cent in the Twin Cities and east of them, and in Kansas City most of the companies sell less than half in the East.

Most of the cattle paper not sold to eastern banks is disposed of to country banks in the territory where the cattle loan company operates and less than 1 per cent of the paper sold by most companies goes to individual investors, although there are some notable exceptions. Among banks it is of interest to note that savings banks in Chicago have in recent years been buying cattle paper in large quantities.

A few companies sell part of their paper to commercial paper houses, but the wisdom of selling much to brokers is considered doubtful by many authorities. It may work out well when money is easy and the demand great, but on the other hand when money is tight, the brokers will refuse to handle more than a fraction of their usual amount of paper. Country banks are not in a position to buy paper and the larger institutions will refuse to take more unless the company's balance, or that of its affiliated bank, is so large that the eastern bank could not afford such a refusal. Even if the eastern bank were willing to take an amount of paper in accordance with the balance carried, the shutting off of a wide channel through which it is normally sold might embarrass the loan company.

No definite arrangements regarding the sale of paper to country banks is made, and it all depends upon the country bank's surplus of funds for investment. Some companies in selling paper to eastern banks, however, make definite arrangements as to the amount the eastern bank will take at any time.

In selling loans they may be sold as a unit, or divided into notes of \$2,500, \$5,000, and \$10,000, the loan company holding the mortgage as trustee. Some buyers of paper, however, will not take part of a loan, but demand all or none.

Loan Methods Used by Banks

Methods used by banks lending on cattle require, in part at least, a separate treatment. Mr. Newman describes the methods of banks west of the Missouri River, dividing the whole region for purposes of comparison into three districts; the southern district, consisting of Arizona, New Mexico, Texas, and the southern half of California; the central district, which includes Oregon, Nevada, Utah, Colorado, Kansas, Oklahoma, and the northern part of California; and the northern district, which is made up of Montana, Idaho, Wyoming, the Dakotas, Nebraska, and Washington. It was found that the percentage of cattle loans to all loans varies greatly with different banks, and although the policy pursued by the bank may have some influence on the importance of cattle loans with the institution, the relative importance of cattle raising in the community would seem to be the prevailing factor.

Of the three districts the central district is the only one in which feeder loans are of any importance, and the importance in this case arises to a large degree from the banks in Kansas. In the northern district the majority of feeder loans are found in Nebraska, where the Corn Belt has been touched upon to some extent. In general, the southern district comes nearer than any other to the old open range type of cattle raising.

The methods of banks in making cattle loans are very similar to those of cattle loan companies, and wherever they are different it is because the bank is intimately acquainted with the borrower and his affairs. On the other hand, the cattle loan company is doing business at a distance and the applicant for a loan may be a stranger concerning whom they must assemble information at short notice.

For this reason the country banks, and in some cases banks in larger places, are able to make loans in a simpler way than loan companies. The information in the application and financial statement required by the cattle loan company is often known to the country banker before application for a loan is made, and it is not necessary for him to have them in such detail. In some cases he may dispense with one or the other form, and of the two, most banks require the financial statement. This is because such a statement is required by the loan company in taking paper from a country bank. If a cattle loan of any size is to be rediscounted with the federal reserve bank, a financial statement must be presented.

The country bank as a rule is just as particular about having a chattel mortgage to secure a loan as is a loan company, but because of personal knowledge of the borrower and his affairs, the bank is not as particular as to inspection as is the loan company. Commercial banks, however, which are in a similar position to a loan company, as far as their personal knowledge of borrowers on cattle paper is concerned, usually make inspections.

The bank's method of putting the proceeds of the loan at the disposal of the borrower is as careful as that of a loan company. Among the risks to avoid is that of misappropriation of the money loaned. For protection the lender's knowledge of what the borrower does is depended upon. For that reason the bill of sale draft which is used by cattle loan companies is practically discarded in some cases by the banks, and the borrower's account simply credited with the amount of the loan.

How Bank and Companies' Methods Differ

The position of banks on the matter of a cattleman borrowing from more than one source is much the same as the loan companies. Some banks will handle loans when the cattleman has borrowed elsewhere, especially if the brands

are different. However, banks do not like to do so and most of them will not make such a loan under ordinary circumstances.

Banks are not as particular as loan companies regarding ownership of land by the borrower. They prefer it, but it is not required. Again, in the matter of margins, the requirements vary with the conditions under which cattle raising is carried on. For stocker loans large margins are required where the business territory of the lending bank is big in proportion to its size, and where such close attention and care cannot be given to loans as in some places in Kansas or Nebraska. Regarding margins on feeder loans, many in Kansas or Nebraska are made with plenty of feed and a good financial statement as the only requirements.

Banks, like loan companies, have maturities, varying with conditions. Feeder loans run for a shorter time than stocker loans. They may have as short a maturity as 30 days, or they may run for 6 months. The average time for feeder loans, however, is about 4 months. Stocker loans, on the other hand, usually run for 6 months with one or more renewals. Some banks which used to make loans for a longer time than 6 months have cut down to that figure in order to make their paper readily discountable at the federal reserve bank. Where cattle raising, rather than feeding is the principal industry, it is usual to renew loans one or more times. Indeed, loans are made with the understanding that if all goes well they will be renewed at maturity until the cattle are ready for market. In this way most of the cattle loans through renewals will last for two or three years.

In handling doubtful loans, banks use similar methods to those of loan companies. Most of them endeavor to get some sort of security, such as real estate or bonds, especially bank stocks, other livestock, life insurance, in fact, almost anything which will make the loan safer. Sometimes a bank feels that tiding over a poorly secured loan will mean giving the bor-

rower time to work out and result in ultimate profit all around. In many cases it is thought best to make the borrower sell. If this had been done at the beginning of the recent price break, many bankers and cattlemen would have been better off.

Country Banks and the Sale of Paper

The country bank is in a very different position from the cattle loan company as regards the sale of paper. The loan company does business with the expectation of having its paper taken off its hands. The bank, on the other hand, makes loans with the intention of keeping all the paper that it is possible to keep and selling the remainder. At one time all of this paper went to the bank's correspondents, including cattle loan companies in the larger cities. At the present a great deal of it goes to the federal reserve banks whenever the bank wishing to dispose of a part of its cattle paper is a member.

Most of the paper is sold to correspondents under an arrangement whereby the correspondent agrees to take a certain amount of paper, based on the average balance of the country bank. This paper is, of course, subject to refusal, on the part of the correspondent, if the conditions under which the individual loan was made are not satisfactory. If the paper is not indorsed by the bank, it is often indorsed by officers or directors. With few exceptions it is indorsed by one or the other.

The conditions affecting profits are the same in the case of banks as with loan companies. Most banks make a greater profit when the money market is near normal than when it is high. The reason is the same in each instance, viz., rates on cattle paper rise and fall more slowly than those in the general market. Again, many banks state that their losses are lower when the money market is normal, which may be explained by the influence of the money market on business conditions.

Cattle Paper As an Investment

Most cattlemen regard cattle paper as commercial paper, and it is so in the sense that any short-term obligation for industrial, commercial, or agricultural purposes is commercial paper. However, if cattle paper is commercial paper, it is a very distinct type and can well be contrasted with paper for financing industrial and commercial enterprises.

In summing up the merits of cattle paper, the first one mentioned by cattlemen and country banks is usually the liquidity of the security. This paper is convertible into cash at any time, for beef is a necessity and the markets are open six days a week at which a sale can always be made. While an oversupply may cause prices to fall, the decline is gradual. In the case of commercial paper, however, the buyer has no lien on anything that can be sold. He has no mortgage security behind a corporation's promise to pay.

The second merit of cattle paper is that the buyer of it enjoys an increasing margin of safety from day to day in normal times. Rarely is the fall in the market greater than the increase in the worth of the security, as has happened in recent years. Again, fat cattle bring a higher price than thin ones, and therefore the increase in the value of the security on account of added weight may be comparatively rapid. And finally, if a loan is properly margined, a fairly heavy loss can be suffered in the worth of the security, without rendering impossible the paying out of the loan.

The third advantage of cattle paper is that the buyer is unusually well guarded aside from any financial protection. This takes the form of protection in the way of information and from the law. On account of the simplicity of the business, any buyer of cattle paper, with the data gathered by the loan company before him, is in a position to know with a fair degree of accuracy how much chance he has of repayment. On the other hand, many businesses selling commercial paper are so

complicated that only persons engaged in the business are really able to know whether or not the concern is in good financial condition. Again, in the matter of legal protection, the buyer of commercial paper has no control over the affairs of the borrower, but the chattel mortgage upon which cattle paper is based protects the buyer against the security being moved, concealed, or fraudulently disposed of.

Indorsement and financial backing are other features making for the safety of cattle paper. Commercial paper houses do not indorse the paper they sell, but in the case of a cattle loan company this is always done, and if the paper is taken through a country bank there may be an indorsement or guaranty by this bank or its officers. In addition, many, and in fact practically all, of the larger cattle loan companies are controlled by banks or individuals of well-known financial standing. It is not likely that either the banks or the individuals would allow any company owned or controlled by them to default on an indorsement. Such a result would be too great a blow to their credit. Finally, cattle paper always commands a higher interest rate than commercial paper, this difference being between $\frac{1}{2}$ of 1 and 2 per cent, depending largely on the money market, commercial paper fluctuating to a much greater extent than cattle paper. The higher rates on cattle paper are explained by the scarcity of money ordinarily existing in a large part of the cattle raising territory, and by the fact that a broad market for cattle paper has not yet been established.

Disadvantages of Cattle Paper

Opposed to these merits there are certain disadvantages of cattle paper urged by those who favor commercial paper. These criticisms fall under four main heads, the first of these being the lack of safety and liquidity. It is urged by some critics that the large losses of recent years are evidence that the value of cattle as security has been overestimated. Again, it is stated that a large part of the commercial paper sold is not

really liquid in character. Loans on which renewals are expected to make the paper actually two years in duration are not of a proper nature for a short-time investment. Loans made for 6 months and then renewed several times work out all right under normal conditions, but under conditions such as have existed during the last two years, when tight money prevented banks and loan companies from disposing of paper, and these institutions, unable to hold all the paper themselves, have had to compel payment in some cases, liquidation may generally occur. The result is that losses may be suffered by all concerned. Critics of cattle paper say that in spite of the statement that cattle can always be sold, even when everyone else is selling, they may have to be sold at such a loss that the security will not bring enough to pay off the loans.

A second criticism of cattle paper is that its market is narrow. In general, eastern banks taking paper from correspondent country banks in the cattle raising districts, and the federal reserve banks in these same regions, are the only places where cattle paper may be sold or rediscounted. Cattle paper suffers from the lack of a nation-wide market.

A third reason given for the failure of banks to invest heavily in cattle paper is the fact that to do so would be counting too much on the strength of one commodity. If one invested in commercial paper he would try to spread his investments among different industries, but no such spread is possible in cattle loan investments.

Finally, a widespread distrust has grown up among many banks throughout the cattle country as to the care with which the loan companies have made their loans. These banks claim that the loan companies took anything and everything during the period when money was easy. Again, many banks believe that these loans were not properly inspected or looked after. Therefore, many of them prefer their own cattle paper to any other type of investment, but would rather have commercial paper than cattle paper coming from the loan companies.

Conclusions on Cattle Paper

It is difficult to draw any conclusion as to the advantages and disadvantages of cattle paper as an investment, other than that cattle paper may be just as good or bad as the loan company that makes the loan. The good qualities of cattle paper under normal conditions have been proved. While the losses on such paper have been heavy in the past two years, a majority of these losses have been borne by the bank or loan company originally making the loan, and the loss has fallen on investors in only a few cases. Regarding the unliquid nature of certain types of cattle paper, it should be realized that it is something affecting the original lender more than the investor. The fact remains, however, that a too heavy marketing of cattle might bring more losses upon the loan company than it could stand. In this case the loss would fall upon the investor, but so far the semipermanent nature of some types of cattle paper has been of no harm to the investor.

It is a fact, and not a matter of conjecture, that the market for cattle paper is a narrow one. This situation can be cured by greater care in the making of cattle loans, thereby proving to bankers throughout the country that cattle paper, properly made, is a safe investment.

There is, finally, a great deal of truth in the claims of bankers in the cattle regions that the proper care has not always been taken. Some cattle loan officials admit that they were careless during the period when money was easy, and afterward when expansion was going on rapidly. Moreover, some of the loan companies that sprang up then faded away just as rapidly, making things worse. Then, too, the loan company and the banker were in competition for loans, and this did not tend to make their feeling for each other very cordial.

How Postwar Depression Was Met

Towards the end of 1920 the general postwar depression in the United States struck the livestock industry, and new

methods of financing were seen to be necessary. This condition of depression in the livestock industry was brought about by several causes, but among them two stand out most prominently. The first cause was the large shrinkage of bank deposits, to meet which the banks were required to collect loans. As this western country was a cattle region, many of the loans were secured by mortgages on cattle. The second cause was the tremendous shrinkage in values of meat animals, amounting to 40 to 50 per cent during the fall of 1920 and spring of 1921. The markets can only absorb a certain amount of meat animals. When the supply is greater than the demand it means lower prices and demoralization. As a result of these causes it was impossible for livestock loans to be liquidated without incurring further loss and causing more demoralization.

Formation of Stock Growers' Finance Corporation

To meet this serious emergency for the whole country, and pending government action, it was realized that confidence had to be restored and new credit machinery provided. A \$50,000,000 pool was formed by New York and Chicago bankers. New York banks contributed \$25,000,000 and some 208 banks in 18 cities contributed the rest. In this way the Stock Growers' Finance Corporation was formed with headquarters at Chicago. In another pool the Live Stock Finance Corporation, also with headquarters at Chicago, was similarly formed. A summary of the work of the first of these institutions is of interest.

No direct loans were made by the Corporation, but livestock paper was rediscounted by it from either national banks, state banks, trust companies, or cattle loan companies who guaranteed payment. Two things especially were required by the subscribing banks: first, that all notes rediscounted by the pool be eligible for rediscount at the federal reserve bank; second, that all loans accepted by the pool have some responsible

indorsing agency between the maker of the paper and the pool. As the organization was not equipped to handle large-volume business, the minimum size of loans was \$5,000. To assist borrowers, advisory committees were appointed in the states where the livestock industry is of primary importance.

The need of the livestock industry for more adequate financing was recognized still further by the government, and this resulted in 1921 in an amendment to the War Finance Corporation Act, whereby loans could be made to banks, bankers, trust companies, and cattle loan companies for the benefit of cattlemen and farmers.

Functioning of War Finance Corporation

The machinery by which the corporation functioned was as follows:

Committees known as "loan agencies" were appointed in practically every middle west and western state. These committees were to receive applications for loans originating within their state, to pass upon the safety and desirability of the credit, and forward its recommendations to the board at Washington. The board in turn was to investigate the loan and notify the applicant of the action taken. If the loan was approved, the corporation was to arrange with a bank conveniently located to make the advance against the documents specified in the application.

Loans were not to be made to individuals, but to banks for the benefit of individuals. The amount that could be advanced to a bank was limited to the aggregate of all that bank's outstanding loans made for agricultural purposes. Loans were to be made for a period of 6 months, with the privilege of renewal, if necessary. The rate on loans definitely to be paid within 6 months was $5\frac{1}{2}$ per cent, and upon others 6 per cent.

The borrowing bank had to execute its application in triplicate, sending all three copies to the state loan agency, holding the collateral, however, until further advised. The collateral

offered did not need to be of any specific kind, but had to be in amount and character satisfactory both to the loan agency and to the War Finance Corporation board at Washington.

This organization, while actively engaged in making loans, rendered a material service to the livestock industry. The War Finance Corporation encouraged the organization of livestock loan companies—not for the purpose of financial gain as had been the purpose of the cattle loan companies, which came into existence during the period of inflation, but with the sole purpose of serving as an intermediary between the banks and livestock growers of the territory represented and the government agency, which eventually supplied the funds. As a marked example of the patriotic manner in which the bankers of America rose to the emergency, Eugene Meyer, Jr., managing director of the War Finance Corporation, recently stated that the capital of the new companies, organized during the last three months of 1921, exceeded the aggregate amount of all capital invested in livestock loan companies existing on October 1, 1921. The result of the co-operative effort not only served the purpose for which the Corporation was revived, but the moral effect was valuable in giving hope to the cattlemen, and encouragement to the cattle loan man and banker in the livestock belt.

More Permanent Livestock Financing Policy

The experience of the past two years has clearly demonstrated that the livestock industry needs a banking facility which is synchronized with the length of time it takes to mature stock for the market. Moreover, it is particularly this end of the business—the growing end as distinguished from the feeding end—that will afford, in the adjustments for the future, the most important and the most interesting problem.³

³ The new Farm Credits bill, which President Harding signed on March 4, 1923, establishes federal intermediate credit banks and authorizes privately financed national agricultural credit corporations.

The credit banks each will have \$5,000,000 of government funds and will be attached to the twelve federal land banks. Under supervision of the Federal Farm

The Problem to be Solved

The livestock industry constitutes one of our great basic activities and involves a turnover of an enormous aggregate amount, but in two respects it has never been properly financed.

In the first place, the financing has not been timed to the requirements of the turnover. The business of fattening livestock, which involves a turnover of 6 months, more or less, can easily be taken care of by existing machinery, but the longer time requirements of the livestock breeding industry, involving a turnover of about 3 years, have been financed through loan companies, which, selling their paper for a maximum of 6 months, have been compelled to limit their loans to a similar period. A 6 months' loan to the owner of a breeding

Loan Board, they will have the following powers:

To make loans or advances directly to any co-operative association which is formed by individuals engaged in producing and marketing staple agricultural products or livestock, provided that the notes are secured by warehouse receipts or shipping documents or by mortgages on livestock.

To buy or sell debentures issued by any other federal intermediate credit bank.

To discount for, or buy from, any state or national bank or trust company, co-operative marketing association, livestock loan company, or agricultural credit corporation, any note, bill of exchange, draft, debenture, or similar obligation, the proceeds whereof have been advanced or employed in the first instance for any agricultural purpose or to raise, breed, fatten, or market livestock.

The banks may issue and sell tax-exempt collateral trust debentures with a maturity of not more than five years up to a total of not to exceed ten times the capital and surplus.

The banks may make loans or discounts with a maturity of not less than six months nor more than three years.

The agricultural credit corporations may be formed anywhere. The minimum capital of each shall be \$250,000, and they are under the direction of the Comptroller of the Currency. Their purpose is to help induce present livestock companies in the Midwest and West to come under federal supervision. Their powers are:

To purchase and sell government obligations.

To make advances on or discount or buy and sell notes which are secured by chattel mortgages and which confer a first lien on maturing or breeding livestock and dairy herds, and which have a maturity of not more than five years.

To issue collateral trust notes or debentures with a maturity up to three years.

To make advances on or discount or buy and sell notes, drafts or bills of exchange issued for an agricultural purpose, having a maturity of not more than nine months and being secured by warehouse receipts or similar documents.

National agricultural credit rediscount corporations, with a minimum capital of \$1,000,000, also are provided by the bill. The highest loan which may be made by an individual by the present land banks is increased from \$10,000 to \$250,000 by the bill, which carried some other provisions to facilitate the operations of the land banks.

The bill also creates a joint committee consisting of three senators and five representatives, to ascertain why state banks have shown a reluctance to enter the federal reserve system.

The War Finance Corporation, which otherwise would lose its agricultural loaning power after June 30, is extended for nine months under the bill.

Increase in the usefulness of the federal reserve system to agriculture is the purpose of a number of amendments to the Federal Reserve Act which are included in the measure. One of the amendments empowers federal reserve banks to discount notes, drafts, and bills of exchange which are issued or drawn for farm purposes with a maximum security of 9 months, instead of 6 months, as authorized at present.

herd, with no assurance of extension, is a hardship to the industry and cannot fail to exercise a discouraging influence.

In the second place, there is need for a radical revision in the methods of handling the supervision and inspection of livestock loans. The ability of the industry to obtain adequate financing at reasonable rates inevitably must depend upon the elimination of some of the unnecessary hazards which have characterized the conduct of the business in the past.

Finally, the recent postwar crisis served to emphasize one outstanding fact—the need for the more gradual marketing of agricultural products, with longer term financing to correspond with this slower process. Unquestionably, it would have been advantageous, even under pre-war conditions, to market our products more gradually. Under present conditions, it is more than a matter of advantage—it is an absolute necessity. If we are to preserve our agriculture, if we are to foster and develop it to meet the needs of an ever-increasing population, this problem must be squarely faced.

CHAPTER XXIV

METHODS OF MARKETING LIVESTOCK

The Centralized Cash Market

The present methods of marketing livestock have been the result of evolution from the early crude methods described in Chapter III. The centralized cash livestock markets of today, whose origin and development are described there, arose as a necessary link in the chain stretching, on the one hand from the place whence the meat supply of the nation comes, and on the other hand to the place where it goes. A series of maps has been given to show the general fact already alluded to that the bulk of livestock production is west of the Mississippi River and the bulk of the meat consumption east of it. Figures, based on estimates of the United States Department of Agriculture and the 1920 population and only approximate, show that :

1. About 80 per cent of the beef cattle are raised west of the Mississippi, while about 70 per cent of the beef is consumed east of the Mississippi.
2. About 50 per cent of the hogs are raised west of the Mississippi, while about 68 per cent of the pork is consumed east of the Mississippi.
3. About 75 per cent of the sheep are raised west of the Mississippi, while about 68 per cent of the mutton and lamb is consumed east of the Mississippi.

The subject of methods of marketing meat animals in its broadest meaning includes or involves: (1) the assembling of livestock from this large western territory; (2) a manufacturing process which results in many by-products; and (3) the

wide distribution of highly perishable finished products. In this chapter, however, only the first, or the marketing of livestock at the present centralized cash livestock markets, will be treated, as the manufacture of by-products and their distribution have been considered in other chapters.

The marketing of livestock is of fundamental importance in the meat industry. Five courses are open to the farmer in selling his fat stock: First, he may kill and dress his own stock, and sell direct to consumers or country stores; second, he may sell to local butchers; third, he may sell to local stock shippers; fourth, he can ship his own stock; and fifth, he can ship with his neighbors through a co-operative shipping association. The first two methods are seldom used because few farmers have the training and equipment for home dressing, and as a rule the producing regions have a far greater supply than the local demand, so that outside markets have to be found.

Marketing Problem

The marketing problem consists in the main in getting livestock to certain great central cash livestock markets.¹ Yet it must be noted that there is also local marketing and distribution as an important element. In connection with central markets the main topics to be considered are the shipment of stock to market, facilities, service charges at the principal livestock markets, the actual sale of livestock, and the distribution of meats through the large packing centers. The factors in local marketing fall under the heads of retail meat markets, municipal abattoirs, local packing plants, and farm-slaughtered meats.

¹ From 40 to 80 per cent of the cattle marketed from the different sections are shipped to the large stockyards and packing centers; 10 to 50 per cent are sold to local butchers and packers and 5 to 15 per cent are either farm-slaughtered or marketed otherwise. From 25 to 80 per cent of hogs go to central markets; 10 to 40 per cent to local retailers and packers; and 5 to 36 per cent farm-slaughtered. From 35 to 90 per cent of sheep go to central markets; 10 to 50 per cent to local butchers and packers; and 1 to 10 per cent are sold in carcass. In all livestock the practice of shipping to central markets prevails most generally in the central states and the greatest prevalence to local marketing is in the extreme eastern, western, and southern states. Meat Situation in the United States, Pt. V, "Methods and Cost of Marketing Livestock," p. 15.

Livestock shipments to the central markets are made in specially built stock cars, which are equipped with watering troughs, and feeding appliances. Very often hogs and sheep are shipped in double-decked cars. The minimum weights for a 36-foot car are 22,000 pounds for cattle, 17,000 pounds for a single-deck car of hogs, and 12,000 pounds for a single-deck car of sheep. These cars are owned for the most part by the carriers, although some belong to private stock car companies. These latter are leased to the railroads at a mileage charge of 6 cents per mile. The freight charges are the same whether stock is shipped in private or railroad owned cars. All weight above the minimum mentioned adds proportionately to the minimum rate. There are state laws and federal regulations requiring that all livestock shall be unloaded at least every 36 hours for feed, water, and rest. At times carriers make up livestock trains, which have the right of way over freight trains and make a speed almost equal to many passenger trains.

Railroad Livestock Rates

The railroads in fixing rates charge different amounts, depending on whether the livestock (cattle or sheep) shipped to the central markets are for slaughter, i.e., "market" or "fat" stock, or whether they are stockers or feeders, which will be shipped out of the central markets to the feeding grounds to be raised and fattened. The former kind of cattle and sheep are shipped on a "100 per cent basis" and the latter on the "75 per cent basis."²

These rates vary according to points of shipment and destination. They are usually uniform from a given shipping point to various Missouri River markets, somewhat higher to St. Louis, and still higher to Chicago, but the Interstate Commerce Commission has enforced a mileage scale on livestock shipments from points in New Mexico, Texas, and Oklahoma to Fort Worth, Oklahoma City, and Wichita. Under this

² 11 I. C. C. Reports 277, 298; 13 I. C. C. Reports 418.

scale the rates gradually increase with the length of the haul, but not in exact proportion to distance. In his book on "Agricultural Commerce," Huebner points out that while this basis does not apply throughout the West, it illustrates the general range of livestock rates.³

Among the problems of livestock transportation from a railroad man's point of view, which can be no more than mentioned here, are the following: (1) unequal distribution of cattle receipts at market points; (2) compliance with 28- to 36-hour federal statutes; (3) law respecting continuous duty of train crews; (4) overloading; and (5) operating stock pick-up trains on time card schedules.

In the marketing of livestock through the centralized markets an important economic factor is the local dealer, shipper, or country buyer. An analysis of the receipts of the large public stockyards of the United States shows that country buyers consign at least 55 per cent of the total number of animals received.⁴ This is because the majority of producers have but a few animals to market at one time, and so have to let some other person gather a carload here and there and ship them. It is by buying a few here and a few there that the local buyer enables the farmer to dispose of his stock as it becomes fat, the stocker being saved the prohibitive freight expense of shipping only a few head at a time and the trouble of unfamiliar business detail.

Co-operative Shipping Associations

Another important method of marketing is through the co-operative livestock shipping association, though many farmers had for years combined assignments of livestock to make up a carload for shipment. Two essentials to their development are sufficient stock to ship and proper management. As evidence of its advantage, the cost for selling cattle

³ See 22 I. C. C. Reports 160, for detailed data.

⁴ Warner, K. F., *Marketing of Livestock Products in Minnesota*, p. 16. This is the best first-hand scholarly account outside of government reports.

is 30 cents a hundred, 32 cents a hundred for hogs and 47 cents a hundred for sheep. Another evidence of this fact is that the number of co-operative shipments received at the central markets is rapidly increasing and the list of co-operative livestock shipping associations has grown from approximately 500 to 4,000 in the last six years.

While the co-operative shipping plan is not new—the first one starting about 37 years ago at Superior, Nebraska—the need has not been felt until recently. Most of the organizations have sprung up in the Middle West, especially in districts where farmers have less than carload lots of stock to market, and where formerly they have been obliged to sell to local or professional buyers. With the coming of the new movement, however, the local buyers are gradually being replaced by the managers of the farmers' co-operative associations.

In 1921, 40 per cent of the hogs received at the Chicago market were shipped through co-operative associations, according to Dr. Doty, former supervisor of the United States Bureau of Markets. From 20 to 25 per cent of all shipments of cattle and hogs are shipped in this way. At St. Paul from 65 to 70 per cent of all livestock receipts come through the co-operative associations. The movement has grown rapidly and there are 700 of these associations in Minnesota alone, about 500 in Iowa, and 300 in Illinois.

Functions of Livestock Markets

The largest single factor in the marketing of meat animals in the United States is the system of centralized livestock markets which has no counterpart in any of the other livestock producing countries of the world. A corollary to the unprecedented development of our centralized markets, which generally is regarded as one of vital importance, is the gradual concentration of ownership and control of the stockyards, terminal facilities and other equipment, and related interests

in the hands of the small group of packers who purchase the bulk of the meat animals sold at these markets.

The functions of central markets, some 50 or more in number, can be summed up as follows:

1. The livestock centers of the Mississippi and Ohio valleys serve as great cash markets, where cattle, hogs, sheep, horses, and other meat and draft animals can be sold by stock growers, breeders, and local dealers.
2. They provide facilities for the handling, care, feeding, weighing, buying and selling of livestock, and the financing of sales.
3. Through their exchanges they enforce rules governing the purchase and sale of livestock.
4. They facilitate the collection of information as to the supply, demand, and other considerations influencing the trade.
5. While livestock prices are not general, as are those of grain or cotton, the central markets do much to facilitate the quotation and publication of prices.
6. They serve as central points from which livestock may conveniently be shipped to stockmen, feeders, and eastern buyers, and exported to foreign markets.
7. Most of the central markets are great packing and slaughtering centers, indeed, they are the final markets for about 70 per cent of their entire receipts of cattle, hogs, and sheep.
8. Their concentration of large numbers of animals at relatively few places and their close connection with packing and slaughtering plants greatly facilitate the federal and state inspection of livestock and meats.

It may be noted, however, in this connection that in order to comprehend the relative importance of the central markets and the relation of each market to the cattle trade of the country, one should know not only the number of cattle received, but also those shipped out and the proportion of stockers and feeders in the shipments.

The following table shows the number of cattle received

at representative large markets during the last half-century or so.

CATTLE RECEIVED AT REPRESENTATIVE LARGE MARKETS, 1870-1921*

Market	1870	1880	1890	1900	1910	1920	1921
Chicago	533,000	1,382,000	3,484,000	2,720,000	3,053,000	3,849,495	3,539,538
Kansas City..	121,000 ²	245,000	1,472,000	1,970,000	2,230,000	2,500,166	2,469,442
Omaha		87,000 ^{3,4}	607,000 ⁴	828,000	1,223,000 ⁴	1,602,799	1,434,576
St. Louis.....	234,000 ⁴	346,000 ⁴	511,000 ⁴	698,000	1,207,000 ⁴	1,253,550	1,077,260
Ft. Worth....				90,000	785,000	1,134,323	983,802
New York.....		883,000	674,000	630,000	615,000	316,291	301,398
St. Joseph....		28,000 ⁴	388,000 ⁴	380,000	510,000	642,899	558,040
St. Paul.....		32,000 ⁶	93,000	176,000	482,000	1,373,114	984,826
Sioux City....		55,000 ^{4,6}	167,000 ⁴	300,000	411,000	751,658	620,373
Denver.....		54,000 ^{4,7}	114,000 ⁴	240,000	383,000	616,565	481,502
Indianapolis..	119,000 ^{4,8}	133,000 ⁴	120,000 ⁴	140,000	309,000	597,097	483,097
Cincinnati....	128,000 ⁵	189,000	172,000	177,000	257,000	441,044	453,974
Buffalo.....				654,000	220,000	676,676	609,063
Pittsburgh....				251,000	150,000	732,770	745,100
Baltimore....				163,000	142,000	286,910	279,333
Philadelphia..				165,000		222,333	227,035
Jersey City....				228,000		833,254	843,928
Boston.....		227,000	168,000	178,000	128,000	75,332	61,348
Louisville....				94,000	126,000	245,361	246,003
Portland, O....					90,000	140,705	119,911
Seattle.....			10,000	19,000	55,000	57,939	47,373

*Omissions are due to the fact that statistics were not obtainable either because a market had not yet been established or else no records were kept.

¹ Calves not included. ² 1871. ³ 1884. ⁴ Includes calves. ⁵ 1874. ⁶ 1888. ⁷ 1878.

Chicago World's Largest Market

Of course it is known to all the world that Chicago is the greatest livestock market. The immense central stockyards, lying some miles to the southwest of the City Hall, are a feature of enormous magnitude in the life of the city. They cover about 500 acres, probably more, including Packingtown, where the packinghouses are. These 500 acres are covered with some 13,000 rectangular pens, with double plank fences paved with brick, concrete, and tile, and fitted with racks for hay and concrete troughs for water. There are 25 miles of streets between the divisions of pens. It is said there are some 300 miles of railway trackage, which intersect the divisions or blocks of pens, and connect the yards with all the railways running into Chicago and also belt the yards and pierce every section of the packing and factory sections. Separate accommodations, except at unloading and loading platforms, are provided for each kind of stock. The enclosures at the loading and unloading platforms each hold slightly more than one carload of stock. To economize space for better

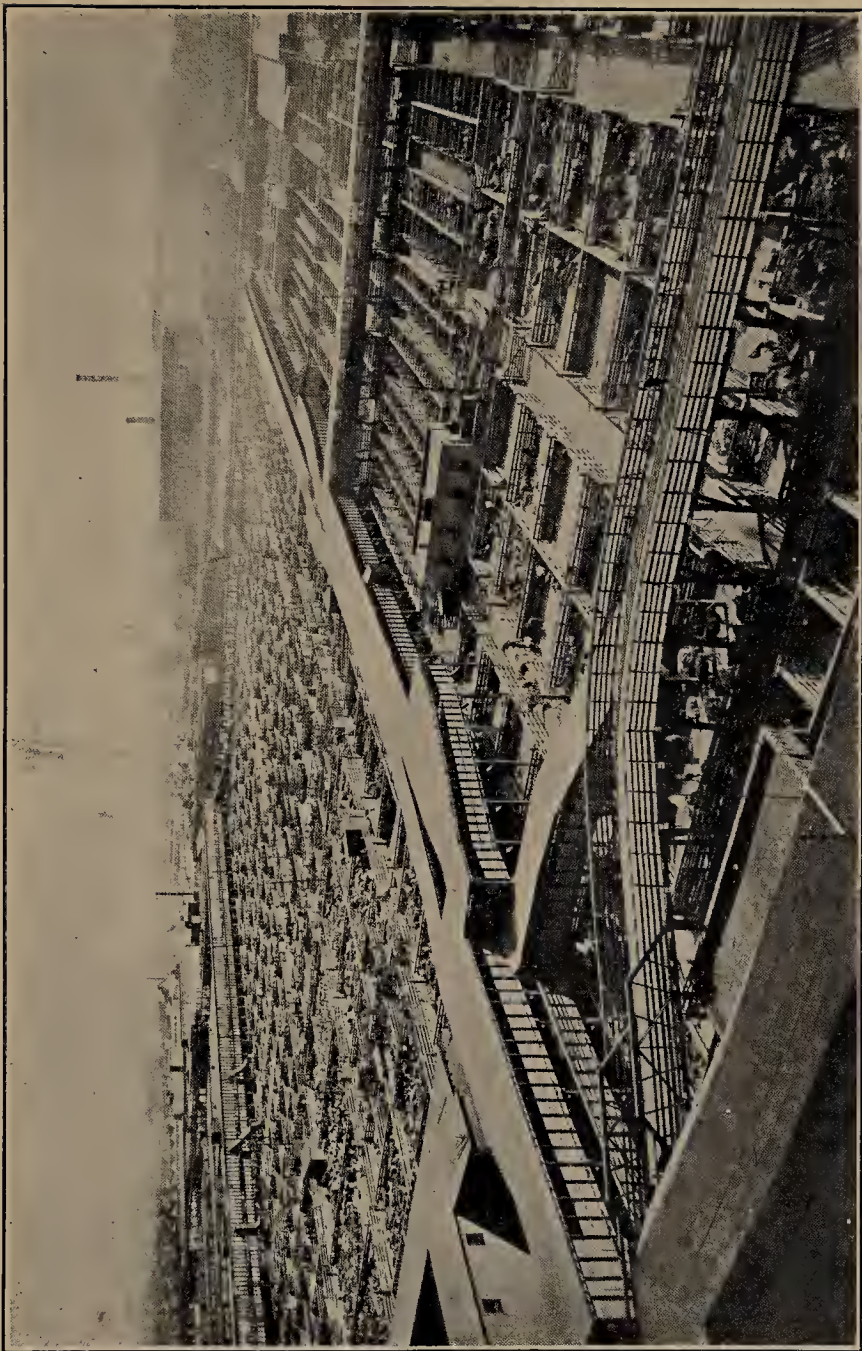


Figure 31. View of Chicago Union Stock Yards

protection of the stock and to facilitate movement from one part of the yards to another, there are miles of overhead viaducts and runways. Sheds of two stories, covering 75 acres, have been built for hogs and there are also great covered sheep houses, both of which are in part double-decked. The water system which supplies the yards from artesian wells and also from Lake Michigan has a reservoir, holding 10,000,000 gallons and pumps, whose daily capacity is 8,000,000 gallons.

The yards are managed by the Union Stock Yard and Transit Company of Chicago, which employs some 2,000 men to take care of the unloading and handling of the livestock. The company itself, however, is not engaged in the buying, selling, or slaughtering, or otherwise disposing of stock. The object of the company is solely to provide proper and adequate facilities for the reception, care, and handling of livestock.

Description of Stockyards

This enumeration of facts already made does not give in any adequate way the impression or significance of the Chicago livestock market at the Union Stock Yards. Robert Shackleton, in his recent work, "The Book of Chicago," does achieve this.⁵ He describes the stockyards as follows:

The great covered sheds, with Rembrandt-like effects of light and shadow, give an odd picturesqueness, as also do the rounders-up, like cowboys on horseback, and the immense length of covered runways and buildings rising low or high, black or gray or some shade of red, above the twenty thousand pens that checker-board the hundreds of acres of space. There are bizarre color effects, from great signs in red or black, with great spaces of yellow; from the blackest of smoke in eddying clouds; from the whitest of steam; from yellows and blues and whites of the long lines of railway cars; from stockyard wagons painted all red or all yellow or all brown; from the colorful costumes of the foreign workers; from the cattle themselves, in reds and grays and blacks and browns. There is the sound of roaring machines, of scurrying horsemen, of the trampling of hoofs. There are the cries of

⁵ Shackleton, Robert, *The Book of Chicago*, pp. 183-184.

the drivers, urgent and sharp, mandatory, the cries of the cattle with a premonition that it means the end, sounds that are expostulative, recalcitrant, making a strange chorus. At times there rises a volumed cry that goes from runway to runway, that is taken up from pen to pen, a dreadful, dissonant, swelling, many-throated cry. In his *Pelleas et Melisande*, Maeterlinck makes one of the characters describe cattle driven to their death, saying, "They cry like lost children; you would say they already smelt the butcher."⁶

How Stock Is Handled

A load of cattle to be marketed is brought by rail to the unloading platform of the stockyards, where the stockyards company receives, unloads, counts, and yards it in the pens assigned to the consignees. Stock is consigned not to individuals, but to commission firms operating in the yards. The pens themselves are owned by the stockyards company and are allotted to the commission firms, rent being charged the shipper as a per head yardage fee. The commission man sorts the load to the best advantage for selling and supervises feeding and watering until the sale is made.

The terminal facilities at all the centralized markets which do a large volume of business are operated either by a traffic department of the stockyards company or by a terminal railroad company. The stockyards companies at all of the large markets are either directly or indirectly owners and operators of the terminal equipment. At the smaller markets where this is not true, the facilities are owned and operated by one or more large railroad companies, or by a joint holding or joint operating company composed of two or more railroads entering the city in which the market is located. At almost all of these markets the terminal companies make a switching charge for the use of the terminal facilities and unloading and loading charges, which are paid finally by either the railroad or the shipper of stock. Dock men of the stockyard company unload

⁶ For a detailed and chatty account of the life of the yards, see Grand, Joseph, *Illustrated History of the Union Stock Yards, Chicago*.

the stock and place the animals in pens adjacent to the unloading platforms. The stock company is also supposed to drive the animals to the pens of the commission companies, but in practice the commission firms often do their own yarding. Five markets have a fee for weighing stock. Four of the markets having such charges are located in the eastern part of the United States and one in the South. An inspection for the purpose of determining the dockage in weight, from 40 to 70 pounds on all sales of hogs involving "stags" and "piggy" sows, is made by representatives of the livestock exchange and has a fee attached.

Classes of Buyers

There are four classes of buyers in the larger livestock markets: the local packer who is buying for immediate slaughter; the buyer of a packing company which has no plant at that particular market; "order buyers," or those who are buying on orders from parties outside; and lastly, the stockman who comes to buy feeders. It is the buyers of the local packers and the feeder-buyers who really constitute the backbone of a market, but it would seem that it is the representatives of the outside packers, the order buyers, and the scalpers who prevent violent fluctuations in prices and tend to hold the normal spread between different markets. In a work dealing with the meat packing industry it is natural for a better understanding of the matter that the relations of livestock marketing should be approached from the side of the packer. Therefore, the next subject is the way the packer buys beef cattle.⁷

Classes of Livestock Bought

Cattle fall into seven general classes, the first five consisting of animals which are ready for slaughter. The first class

⁷ The following account is based on observation, conversations with men like Wellington Leavitt, head cattle buyer for Swift and Company, and many livestock commission men, government reports, and material in *The National Provisioner*, *Armco* (Armour's salesmen's magazine), and the *Buzzer* (house organ of Swift and Company). The description is mainly of Chicago, the center of activity and the large-scale system.

is "beef" cattle, and includes only fattened steers that may be sold as carcass beef. The second class is "butcher stock," which consists of the inferior steers and all the cows and heifers, with the exception of the very poorest. These latter make up a third class, subdivided as "cutters," "strippers," and "canners." They are the old, thin animals which are fit only for boneless cuts, canned and cured meats, and sausage. The fourth class, made up of "bulls," is used mainly for sausage, though the younger and better ones are sold very often as dressed beef or beef cuts, in which case they are called "butcher stock." The fifth class consists of calves and is known as such. The last two classes are called "stockers" and "feeders," including in them thin cattle, both male and female, for further fattening. Of these the stockers are usually younger and generally weigh under 700 pounds, while the feeders are older and heavier. The stock buyer at the central markets is at the fountainhead of the whole industry and is the price-maker who sets the pace for all the business of the packing industry. The situation from the center at Chicago is now to be considered.

The livestock buying system in Chicago is as efficient as any of its kind in America. The men who do the cattle buying are old hands at the business, and the extent of their responsibility may be judged from the fact that the 50 or 60 men of all companies in the several markets buy all the cattle disposed of through, in some cases, as many as 400 branch houses and by a force of 3,000 managers and salesmen. These men must not only possess the faculty of judging all manner of cattle by sight and in large numbers on the hoof, but must, at the same time, keep in mind the needs of the sales organizations regarding assortment of weights, kinds, and quality.

Chicago Packers' Buying System

To this end one man in Chicago supervises all the buying of cattle for each company and keeps in telegraphic com-

munication with the buyers at Fort Worth, Kansas City, East St. Louis, Sioux City, and St. Joseph. This head buyer has offices in a specially constructed building in the heart of the stockyards at Chicago, where he and his assistants do business with an army of commission men and against the competition of other packers, speculators, and feeders as well as a number of order buyers, who ship live cattle and killers throughout the East. The number of men in the buying department of Armour and Company, for example, is about 200. This number includes men who act as scalers, weight takers, yard men, and cattle drivers.

In giving daily instructions to his assistant buyers at Chicago, the head buyer assigns to each man a certain section of the extensive cattle pens—for instance, four or five divisions. To each man he gives authority to buy a certain number within a certain price range in his territory, but this individual buyer may govern himself according to market developments, buying more than his orders if the price is low, or a less number if the price is high. Among all of them the day's aggregate will be made up according to what the requirements are as indicated by the dressed beef sales department and the class of stock he has to select from.

Daily Schedule of Work

While the actual buying of cattle does not begin in Chicago before 8:30 to 9:30 A.M., depending upon the demands, the buying force must be on hand before that hour to be prepared. Indeed, the cattle buyer's office is tense with business as early as 7:30 and usually a member of the dressed beef sales department is present with full information as to the requirements of branch houses. In this way the buyers are advised as to what kind of an assortment is necessary to satisfy the demands of the trade in the various cities of the country. The first business of the day is to get into communication with outside markets. This is to ascertain how nearly each has been able

to carry out the instructions of the day before and to get a line on the market conditions at all points as a basis for the ensuing day's work.

The required information from Omaha, Kansas City, St. Joseph, Sioux City, and St. Louis is usually in and upon the head buyer's desk when he arrives in the morning. His first hour is spent in telephone communication with the cattle buyers at these points, discussing conditions and wiring instructions for purchasing according to the needs of the company and the peculiar advantages and disadvantages of the prevailing market at each point. If the market looks good, his advice will be to buy cattle steady, strong or higher. If indications point to a slump in prices, he will give orders to buy cattle lower. By the time he has disposed of these markets, communication is established with the more distant points, such as New York, Pittsburgh, Louisville, Denver, Fort Worth, Buffalo, Jersey City, and other markets where the packing companies have representatives.

Cattle Buying

Most of the cattle coming to Chicago arrive at the Union Stock Yards between the hours of 5 and 9 A.M., although shipments frequently appear at later hours in the day. Those arriving after 3 P.M., however, are counted in the following day's receipts. Upon their arrival employees of the Union Stock Yards and Transit Company, the independent corporation which owns and operates the yards, take charge and "yard" them. They are then turned over to the employees of the particular commission house to which they have been consigned, who feed and water them and endeavor to put them at their ease before offering for sale.

In all the big markets, cattle buyers are mounted. A corps of men, including the buyers of several packers, speculators, order buyers for eastern houses, and feeder-buyers, who sometimes pay higher prices than the packers, ride through one



Figure 32. Buying Cattle in the Yards
Pen of Prime Steers

section of the pens after another until they see an opportunity of making a trade with some commission man who has a string of cattle which they like.

Each lot of cattle is stirred up in its turn and examined, and bids are made. For instance, a commission man shows a string of cattle of 10 or 20 carloads and sometimes lots as large as 50 to 100 carloads at seasons when cattle are plentiful. If the demand is keen the market will open high, and it is often wise for the buyer to "go slow" early in the day, depending upon the prospect of getting his requirements at a less cost than what was asked early in the morning.

A Typical Incident

An illustration of how this buying goes on may be given by gathering a snatch of the conversation between a Swift buyer and a commission man, which goes with every sale. It runs thus:

"Lo, Eddie, come look at a load of dandy white faces from some farms near Des Moines, Iowa. Ever see such class? You can't touch 'em this morning in the yards, Eddie."

"How much?"

"Well, Eddie, I'll weigh them for you for 16 cents."

"See you later."

"Now, Eddie, wait a minute. This is better stuff than I sold you last week at 17 cents and you know what the market is to-day. I know where I can get $16\frac{1}{2}$ cents a pound on this load. Now mind you, Eddie, this stock has been tied up three days near Clinton by a broken bridge. Six days in a car! Of course they look a little drawn. Give me $15\frac{3}{4}$."

An hour later the Swift buyer rides past the same pen and once more examines this load, comparing it with what other commission men are offering. The price may have dropped slightly, but he holds firm, and after another hour, on his third trip, probably compromises at a satisfactory figure.

After the buyer has decided on a purchase, he utters only a laconic, "Weigh 'em to Swift," and passes on to drive another bargain. He has made a purchase, but he has not written a notation of any kind. He carries the price asked by the commis-

sion man, his various bids, competitor's bids, the final price effected for a sale, and all of the details in his head. And so does the commission man. There exists a tacit understanding that neither will take advantage of the other, by shifting figures in this oral bargaining, and the Swift buyer completes his day's work in the pen without the aid of a pencil, but later he puts down the prices at the Swift office.

Stocker Cattle

Not all the cattle which are consigned to Chicago from western points are fat enough for killing. Nearly always there are a few animals in a lot, which are excluded and counted out by the packer-buyer before a deal is closed, as not being fat enough for beef. The western shipper is aware of the poor finish of certain specimens, but is obliged to ship them anyway because of the closing of the grass season in this section. Those cattle are disposed of to local feeders—farmers in nearby states who watch the market for them and take them back to the country. Here they put them on hay and corn and fatten them for a later market. Cattle which have gone through this process make the best possible fancy beef, and come to market through the winter and spring months when grass-fed cattle are out of season.

However, it is a matter for the buyer to note any animals in the lot which may be deficient in beef qualities and to point them out to the seller. This is a point wherein the efficiency of the buyer asserts itself. Some animals are very deceptive on account of their short build and breadth of back, which might be taken for well-filled flesh, and two or three in a lot which fall below the required standard may so depress the percentage of yield of the whole lot as to spell the difference between a good "buy" and a bad one.

Judging Cattle

An official buyer sums up the judging of cattle in this manner :

To the experienced buyer there are a number of ways to make certain of the beef yielding qualities of any bullock or steer. Defects stand out boldly before the eyes of a man who trains himself to look for them and to see them and who has been constantly in the game for many years. And among the first points an expert buyer looks for are a fat wattle under an animal's jaw and width across the shoulders. The shoulders should be thick and square clear up to the neck, so that there should be a good yield of beef all the way along. If bullock is broad along the back, but sharp at the neck, there is want of beef there.

Another way to judge a bullock is from a point several feet straight behind him. Notice the conformation of his hips and back. If he has been thoroughly fed his "pants" will be tight, and he will be straight and flat across the buttock. If not, he will be divided and have the appearance of being split all the way up, which indicates a lack of meat between the legs or in the shanks. Again, get him into action and when he steps notice whether he has a good flank. If he does, this indicates that a good yield of beef can be expected from him.

Quality of Breeding

Quality of breeding too enters into the business all the time, regardless of fatness and finish of feeding. A well-bred animal is well proportioned, and will yield a higher percentage of good beef. No feeder, however expert, can put a very good loin upon a badly proportioned or ill-shaped bullock. One of the aims of breeding is to make him thick in the loin, back and quarter, so that he will not only yield a high percentage of good beef, but cut out nicely on the block. The mongrel-bred animal cannot be depended on to do this. He will have a big, long rib, enclosing a bulky paunch. He will have a big, bony shoulder, head and neck. He will not have the thick, short round so attractive from the butcher's viewpoint. Take a high bred steer and a mongrel and feed them side by side. Give them the same treatment and the same amount and kind of food. The one will fill out thick, stocky and well proportioned, while the other will be loosely hung. One will dress out 60 per cent while the other yields down around 55 per cent.

All the buyers are constantly coached in these points and in the course of a few years they become quite proficient in judging cattle. In fact nearly all of them received their training right here in our own business. These men make better buyers than

can be found on the outside. We have one set of men who specialize to some extent in butcher stuff because of its difference from the regular run and others who make a special study of steers.

Methods of Payment

After cattle are bought they are given lot numbers by the packers and sent to the scales by the commission man. Each purchase is designated as a lot except the odds and ends of cows and butcher stock, which come from scattered sources and are bought in small lots from one to ten or lotted under the name of the buyer. Each lot is driven to the scales, where it is weighed by the Union Stock Yards Company, which makes out a weight ticket. This is known as the "pig ticket" system. The name of the commission man, the number of cattle, weight, and price rate are filled in, the ticket is stamped by the Union Stock Yards and Transit Company, the commission man figures the amount and totals the ticket, and presents it to the packing company for payment. It is checked up by the chief clerk or accountant and indorsed by him, and goes through the bank the same as an ordinary check.

The details by which these settlements are made in the markets through the livestock exchange are as follows: The stock is weighed in charge of buyers subject to removal to slaughter houses or shipment. Weighmasters' certificates, showing the number of head and weight of each draft of animals sold, are received by the seller and sent to his office. The commission man's cashier next sends to the purchaser a plain bill, consisting of a duplicate of the weighmaster's certificate to which has been added the price and amount. The purchaser approving it returns the duplicate to the commission merchant with an order on the back of it on a Chicago bank to pay the commission house a stated sum of money. When this order is paid and comes back to the purchaser in the form of an honored check, it is a complete voucher showing every element of the transaction, embracing a facsimile or the weighmaster's certifi-

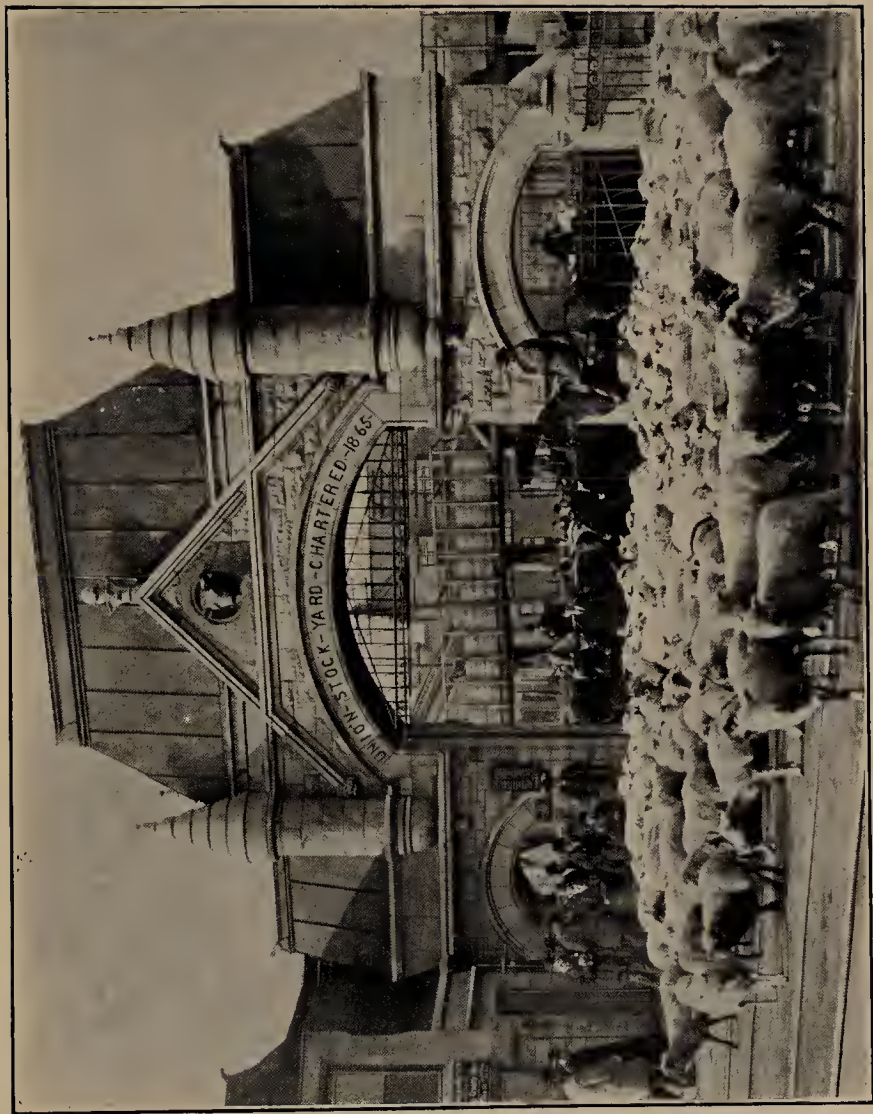


Figure 33. Entrance to Chicago Union Stock Yards

cate, the commission firm's indorsement, and the bank's stamp showing date of payment. Before payment is received from the purchaser, however, the commission merchant makes and mails to the shipper a statement in which he enters the gross proceeds of the sale, deducts the freight and other charges, and remits the net proceeds according to the instructions received. The shipper thus had the net proceeds the day after shipping, either in the form of negotiable bank paper or else a deposit of the amount subject to his check at his home bank; the commission merchant has received his pay credited to him in a Chicago bank, the purchaser has paid for the stock, and the big trainload of stock has been received, handled, and sold for slaughter or export without a dollar of actual money passing hands. At stated times the commission men give checks to the Union Stock Yard Company for freight and other charges, the stockyards company settling with the railroads.

On being bought and weighed the cattle are driven to the pens and taken care of until called for by cattle drivers from the packinghouse, when they are turned into the elevated chutes to be conducted across the stockyards and into the killing rooms. The lot numbers above referred to remain with these cattle all the way through from buying to selling. They are bought as lot #26, weighed as lot #26, killed as lot #26, shipped as lot #26, and sold as lot #26, although of course a complete lot is not always shipped to the same branch house. The sales tickets are usually reassembled after the returns come in and the buyer has the satisfaction of seeing the results of his labor.

Cattle are not usually slaughtered the same day that they are bought, but this depends upon the time of the week. They need to be thoroughly rested, fed, watered, and cooled before killing, otherwise they will dress red, or "fiery." The packers aim to slaughter the receipts within two days after they are purchased. Every precaution is taken to insure conversion of cattle into the most perfect beef. There can be no delay

if the beef is to be the best. Again, cattle once bought must go through the packinghouse rapidly, so that others can take their places. The packer would lose more by having his plant idle for one day than by holding off and refusing 1 cent more per pound for cattle.

Checking Up on Buying

After slaughtering, the buyer makes his daily tour of the cooling rooms in company with a representative of the dressed beef sales department and inspects carefully the tagged and classified sides of beef as they hang during refrigeration. By this means he is able to check, while the purchase is still fresh in his mind, the accuracy of his ability to judge from the animals on the hoof what the weight and appearance of the beef on the hook will be. The criterion is that a fairly good drove of cattle will dress out on an average of $57\frac{1}{2}$ to $58\frac{1}{2}$ pounds per 100 of their live weight, although some go to 62 to $63\frac{1}{2}$ pounds.

The buying of hogs is along the same general lines as that of cattle and sheep, so that a detailed description of the process is unnecessary. Hogs are less closely classified than other kinds of stock. "Butcher hogs" are mainly barrows and correspond to "beef cattle." "Packing hogs" contain the rougher, less uniform grades, and include old brood sows and the like. As their name implies, they are used mostly for "packing" or, in other words, for smoked, dry salt, or barreled pork. "Light hogs" average from 125 to 220 pounds and make the better grades of bacon and fresh pork. The "pigs" are the younger animals, weighing less than 125 pounds. After them come the "boars," "stags," "roughs," and other odds and ends.

Direct Sale in California

In the Pacific Coast region livestock was not marketed at central cash markets until 1922, but was sold direct to packers.

The reason for the absence of such markets in California, and the fact that there was only direct purchase from producers, was largely due to the circumstance that important livestock producers had banded together and kept markets out of that region. This had killed California for the small producer. However, plans for establishing stockyards at one or two points have now been realized at Los Angeles, which has excellent prospects for development as an important livestock marketing center. Another reason for the lack of centralized markets was that, in addition to home production, much of the meat and meat products consumed there was shipped in from other states.

In Massachusetts also there is considerable direct buying by packers, the stock being shipped to plants in Boston and other cities. Of course some of the estimates representing sales to local packers in New England relate to animals which are slaughtered in plants in the large cities.⁸ There are some who hold that it is most unfortunate, but these are few.⁹

Livestock Exchanges

Finally, in connection with marketing livestock, there should be emphasized the great importance of the National Live Stock Exchange and the various livestock exchanges at the different stockyards. These exchanges have been and are of invaluable significance in stabilizing and standardizing the methods which have been described. Because of their existence, the methods and mechanism of marketing work normally, quickly, and efficiently. The first livestock exchange was in Cincinnati, and the second in Chicago, in 1887, from which the movement has spread until there are some 30 exchanges.¹⁰

⁸ Meat Situation in the U. S., Pt. V, p. 26; and Andrews, Frank, "Marketing Grain and Livestock on the Pacific Coast Region," U. S. Department of Agriculture, Bureau of Statistics Bulletin No. 89.

⁹ Damsel, G. H., Address, "Direct Purchase of Livestock by Packers," pamphlet (Library Harvard Graduate School of Business Administration).

¹⁰ The more important ones are at the following places: Baltimore, Chicago, Cincinnati, Cleveland, Denver, Detroit, East Buffalo, Indianapolis, Jacksonville, Jersey City, Kansas City, Louisville, Milwaukee, Montgomery, Alabama, Nashville, Tennessee, St. Louis, New Orleans, Oklahoma City, Omaha, Peoria, Illinois, Pittsburgh, Portland, Oregon, Sioux City, Sioux Falls, St. Joseph, Missouri, St. Paul, and Wichita, Kansas.

Of these the Chicago Live Stock Exchange is the most powerful, and is of such significance in the livestock industry that a statement of its objects and work deserves mention.

Functions of Livestock Exchanges

The most complete definition of a livestock exchange appeared recently in the *Kansas City Journal*.

A livestock exchange is an association for encouraging the production of livestock and meat products, and for defense of all interests identified therewith against everything detrimental to honest trade. It is a name given to a voluntary association of livestock producers, shippers, packers, commission men and bankers organized not for profit, but to secure in the mutual interest of consumers, producers, domestic distributors and exporters of livestock and meat products, uniformity of business usages and customs, adequate inspection of animals and meats, needed legislation for the protection and promotion of livestock interests and all other legitimate advantages to be secured through the power of organization.

The reason for the existence of the Chicago and other livestock exchanges is that they can accomplish more for the livestock industry than could be secured by individual efforts. They came into existence from necessity, in order to defend the livestock trade against constant disputes over the dockage of hogs, the presence on the market of dishonest and irresponsible buyers and sellers, unjust discrimination in railroad rates and commissions for selling livestock, the slaughter and sale of diseased animals for food, injurious legislation, and other wrongs and abuses that could not be suppressed in any other way than through adequate organization, through concentrated action, and by agreement of the majority to abide by certain rules and refuse to deal with those who violated such rules.¹¹

¹¹ See Rules and By-Laws of Chicago Live Stock Exchange, Reports of the Sanitary Committee of the Exchange and Livestock Commission Men, by Everett C. Brown, President, Chicago Live Stock Exchange, and C. B. Heinemann, Secretary, National Live Stock Exchange, Chicago, 1917. Mr. Heinemann is now (1923) vice-president of the Institute of American Meat Packers and the author is indebted to him for many helpful criticisms.

CHAPTER XXV

CYCLES OF LIVESTOCK MARKETING—BEEF CATTLE

A Basis for Progress

A study of the various seasonal movements or cycles in the marketing of livestock with the ensuing problems follows naturally upon consideration of the extension of livestock production, the grades and classes of livestock produced, the financing of their production, and the methods of marketing livestock. These cycles are of very great importance in understanding the supply which is marketed and the whole price fabric. At the present time they are of special interest in the working out of plans for modifying the present system of marketing livestock and for bringing about a more orderly marketing program, since the fundamental livestock movements must be taken as a basis on which to build. To get at the actual situation it is necessary to consider separately the different kinds of livestock. Therefore, the cycles of marketing of cattle, western cattle, hogs, and sheep will be treated in the order mentioned.¹

Production of cattle is quite general in the United States, as has been noted, and this is true to a greater extent in the case of cattle than in the case of hogs and sheep. Throughout large areas of the country, cattle, when they are converted into beef, are slaughtered in the same place where they are pro-

¹ This study of cycles of marketing is largely based upon special investigations, and also unpublished reports by Mr. C. L. Harlan, formerly with the Corn Belt Meat Producers' Association and now of the United States Bureau of Agricultural Economics, made to the Committee on Orderly Marketing of the Farmers' Livestock Marketing Committee of Fifteen of the American Farm Bureau Federation. This committee worked out a plan for orderly marketing during 1921, and Secretary-Treasurer Herbert W. Mumford and Mr. C. L. Harlan very kindly granted permission to use this hitherto unpublished material.

duced, and are used in local consumption. In some sections of the country this local cattle and beef supply is sufficient to meet the local demand, and where this is so there is no great movement of cattle or beef in or out of the locality. In other words, there is no marketing of cattle with fundamental seasonal trends to be considered.

Cattle Move from Surplus Areas

In some sections there is a large surplus of cattle produced, but in others there are not nearly enough cattle raised to satisfy the consumptive demand. The marketing problem of cattle is involved in getting these surplus supplies of cattle to the centers of consumption, or to the centers where they can be slaughtered for consumption. Closely bound up with this is the movement of cattle to market from farms and feed lots, both in states of surplus and in those of deficient production, to supply the wants of the town populations of those states. The sections producing a surplus of cattle are the Corn Belt states and the region immediately surrounding them, the western range states, Texas, and the Southwest. The Pacific Coast states are a region by themselves, as nearly all the local production, though large, is consumed there and does not enter the general commercial movement, except on a very limited scale under exceptional conditions. It is the market movement of the cattle in the above-named regions to the markets located in those regions that is considered as the general commercial movement.

The movement of cattle in these regions, as far as it is designed for slaughter, is almost in its entirety a movement through the stockyards markets. Most of the feeder cattle movement takes the same route. There is also a large flow of stocker cattle through these markets, but at the same time a large direct movement, this being especially the case with cattle from the southern breeding regions to northern pastures and ranges. As they come to the markets cattle are bought

either for slaughter, or for return to the country for stocking or feeding purposes. The cattle for slaughter are bought either by local slaughterers, or by order buyers for shipment alive to be slaughtered at other points. Stocker and feeder cattle are bought either by farmers and feeders direct, by commission firms on orders, or by dealers in these kinds of cattle.

Classifying Cattle at Markets

Cattle as they come to market are of all kinds and descriptions, and they are classified and graded in various ways depending upon their sex, quality, age, condition, and the use to be made of them. There are wide differences in quality of the same kinds and also in condition, and these differences are reflected in the price range. Grading is on the basis of quality and condition, but as the scale from the poorest to the best grows by almost imperceptible degrees, the line of demarkation between grades is not easy to make and is still more difficult to define. The decision is altogether a matter of the eye and the hand, and there is no fixed standard that can be applied to assist or support a judgment.

For this reason the fixing or standardizing grades has made little progress and so the trading in cattle, especially for slaughter, is almost entirely on the basis of inspection of the full lot. For commodities that must be traded in in this way, and that move in large volume, a market where buyers of all kinds can find what they want doubtless furnishes the best outlet. Hence, the central markets as they have been developed are well suited to the necessities of cattle marketing.

There is no clear relationship between the estimated numbers of cattle in the country, or in any particular section of the country, and movement to market or inspected slaughter. For the ten years from 1911 to 1920 the percentages of inspected slaughters to estimated number of cattle were 12.6, 12.5, 12.3, 11.9, 12.3, 13.4, 16, 17.9, 18.7, and 11.1. Nevertheless, while the estimated number only increased between 1911 and 1918

from 60,500,000 to 66,800,000, the inspected slaughters increased from 7,600,000 to 11,900,000, the former an increase of 11 per cent and the latter of 56 per cent. The relationship between estimated numbers and stockyards receipts during the same period shows the same disparity. No doubt this variation is due in considerable part to the inexactness of the government figures, but even if these were approximately correct there would still be a considerable difference in the yearly percentages.

Increase in Numbers Not Reflected in Receipts

Among the more important reasons for this situation are: (1) When the cattle industry is prosperous and starts to expand, the receipts fall off while the numbers are increasing, because of the retention of breeding stock that would otherwise be marketed. Such periods are marked by a falling off in the marketings of beef-bred veal calves and of cows and heifers. (2) Increases in the number of dairy cattle do not result in as large additions to cattle for market as do increases in beef cattle. (3) Increases in numbers in large sections of the country, especially in the South, do not result in increasing either the commercial marketings or inspected slaughter in any proportionate degree, for the production there does not go to slaughter through these channels.

The supply of cattle is drawn from many sources and these are produced under a great variety of conditions and for different purposes, but practically all cattle in the country at a given time will ultimately be slaughtered and contribute to the beef supply, either local or commercial, if they do not die before their usefulness for other purposes is exhausted. However, different kinds of cattle and different regions of production furnish different proportions of animals for slaughter each year, and this proportion is not constant from year to year for the same kind or region. Therefore, attempts to forecast cattle and beef supplies on the basis of existing numbers, even if

these were reliable and sufficiently differentiated as to kind and section, can never reach more than limited results.

Importance of Fall Marketings

The great part of the cattle that go through stockyards markets make their first trip to market as pasture- or range-raised cattle. This means that they have received no other preparation for market than what is furnished them by the pastures or ranges on which they have run. Ordinarily, cattle are marketed when they are in the best condition, and the result is that the big run of cattle comes in the fall, since it is then that grass-finished cattle are most fit. As these cattle are marketed they are bought either for immediate slaughter and thus furnish the current supply of beef, or for return to the country to contribute to the near or more distant future supplies of beef.

While the number slaughtered during this autumn period is the largest of the year, the percentage of slaughter to marketing is the smallest, and the percentage of the stocker and feeder shipments is the greatest. The marketings during September, October, and November run around 35 per cent of the year's total, while the inspected slaughter is ordinarily less than 30 per cent, and the stocker and feeder movement is around 40 per cent of the respective year's totals. Thus, this fall movement, by furnishing a large part of the supply of feeder cattle, determines to a considerable extent what the future supplies of beef cattle will be.

Cattle Crop Year Begins in September

It seems wise, then, to consider this fall movement as the commencement of the cattle marketing year, and to arrange cattle statistics on the basis of a crop year beginning September 1 and ending August 31 of the following year. The crop year chosen in this way is divided into four 3 months' periods or quarters. Arranged in this manner, the receipts over a period

of years show that the percentage of cattle marketed each quarter does not vary greatly from year to year. The quarterly averages of the receipts at the seven largest markets for seven years are 34.6, 23.6, 19.3, and 22.4, the deviations from the average being about the same for each quarter. The seasonal averages for inspected slaughter for the same period are 29.7, 25.1, 21.2, and 23.9, and the deviations from the average are even less than with the marketings.

The kind of cattle and the regions of supply for each quarter of the year are quite similar from year to year, as is also the market disposition made of the supply. About 60 per cent of the total marketings go through the seven large markets, Chicago, Kansas City, Omaha, East St. Louis, St. Paul, St. Joseph, and Sioux City, and as these markets draw their supplies from all the various regions of production, the movement in and out of them reflects quite accurately the total situation.

Receipts during First Quarter—Grass Cattle

The receipts during the first quarter, i.e., from September 1 to November 30, will be made up largely of grass cattle. These come from the northwest ranges, the sand hill and short grass country, Kansas and Oklahoma pastures, Texas and the Southwest, Corn Belt pastures, and pastures and grazing sections in regions north and south of the Corn Belt proper. A considerable part of these can find but one outlet, the slaughterers. This part of the grass cattle marketed in the first quarter will include bulls, fat cows and heifers, fat steers, all kinds of canners and cutters, and many others lacking in quality for stocker and feeder purposes. Another considerable part can be used for either purpose, and the disposition made of them will depend upon the competitive demand. The rest, between 40 and 50 per cent, will go back to the country. The cattle going back will consist largely of steers, but with considerable numbers of female animals for either breeding or feeding purposes.

The balance of the receipts during this first quarter will be grain finished, either from pastures or feed lots of the Corn Belt. The percentage of this kind is the smallest of the year, as are also the actual numbers, for they consist of long-fed cattle that sell in a class by themselves, and short-feds that sell in competition with the better grades of grass cattle.

Receipts during Second Quarter—Short-Fed Cattle

The receipts during the second quarter, i.e., from December 1 to February 28, are made up almost entirely of short-fed cattle. The wind-up of the range movement sometimes runs over into the first week or two of March, and in exceptional years cattle may have continued on pastures late enough to come direct from them, but ordinarily some grain or forage feeding precedes the marketing. Many come from corn stalk fields, having been used as gleaners there, especially during the first month or so. Others have been carried along on roughage, but the great bulk of them have been fed some grain. During the first month there is a clean-up of the supply of long-fed cattle, these going for the holiday trade, and after that the percentage of good and choice cattle is very small, but increasing progressively with the season. The receipts come very largely from the Corn Belt.

The supply during the second quarter includes cattle both for slaughter and for return to the country, the latter making up about 20 per cent of the total at all markets, and consisting largely of warmed-up steers.

Third Quarter Receipts—Medium and Long-Fed Steers

During the third quarter, i.e., from March 1 to May 31, the receipts are made up quite largely of medium- and long-fed cattle, mostly steers. The actual numbers and the percentage of these kinds are the largest of the year. There is also a movement of grass cattle from the more southerly regions, and of butcher cattle that have been well wintered in the Corn

Belt and turned out on early pasture. A considerable movement of stock cattle from the southern breeding sections takes place in April and May through the central markets, while a much larger movement goes direct. The stocker and feeder movement makes up about 20 per cent of the total.

Fourth Quarter Receipts Like Third

The supply during the last quarter, i.e., from June 1 to August 31, is quite similar to that of the third, both in kind and in point of origin. However, the number and percentage of long-fed cattle are smaller, while of grass-fed cattle they are increasingly larger. A considerable part of the grain-fed cattle have been finished on pasture and are more or less "grassy." The movement of range and western grass cattle usually makes a start during the month of August and in some years reaches fair proportions. If the separation into seasons were not made by calendar months, it would be necessary to include the latter half of August with the fall movement. The out movement of stocker and feeder cattle during this quarter is also about 20 per cent of the receipts at all markets.

This in short outline is the cycle of yearly cattle movement going to the principal markets, through which passes the large part of the supply. There are small localized movements going both to these larger markets and to smaller ones which are not covered here. The comparative importance of the various sources from which these cattle come has never been determined. Probably half of them were born and partly raised in the western and semiwestern and southwestern regions. From the region of birth they go by different routes and by shorter or longer stages until they are finally bought for slaughter.

Cattle Production in Three Classes

In a general way cattle production may be separated into three classes: (1) cattle production or finishing as an activity

in and for itself, (2) as a part of a mixed farming activity, and (3) as a by-product of the dairy industry. The movement to market is largely determined by the conditions of production, and these conditions result in the seasonable movements just outlined. These controlling conditions may be in the industry itself or in the collateral industry.

The range cattle movement is determined by conditions in the industry itself. The movement from the dairy regions is largely controlled by conditions in the dairy industry. The movement of butcher cattle from farming sections is determined by general farming conditions, such as those of pastures, amount and value of feeds and forage, local financial conditions, etc. The movement within the season is partly by chance and partly due to automatic price control, each individual shipper acting upon his judgment as to the best time to reach the market. The kind of cattle whose movement is least determined by conditions of production, and with which the volition of the producer has greatest scope, is fed cattle, but this volition is exercised rather in determining the time when the activity shall take place, its length, and the time of marketing. Once begun, it must be carried out much after the original plan, although here too there is much latitude.

How Market Price Is Determined

The market price of all cattle is determined in large part, either directly or indirectly, by the value of the products derived from the slaughter of the various kinds. With animals bought for killing this is directly the determining factor. With animals bought for stocker or feeder purposes, the value of the killing kinds into which they are to be developed is a large factor in determining what will be paid for them.

The current price of cattle, the price from day to day, is fixed by the daily effective demand in relation to the immediately available supply. Effective demand, as used here, is the willingness and ability of buyers of all kinds to purchase

cattle at a price which promises them a profit, according to the purpose for which the buyers may use them. The available supply is the number in the yards offered for sale. The decision as to what can be paid is determined by the present and estimated future values of different grades of beef and by-products, based on knowledge of market conditions, supplies in coolers and storage, probable future supplies of cattle to be marketed, and the estimated value of stocker and feeder cattle for the part of the supply suitable for such purposes.

The price that will be paid for individual lots of cattle will be determined by the competitive judgments of different buyers as to their value for the purposes in mind. The function of the salesman in the sale and purchase transaction is to display the lot to the best advantage to the buyers, who, he thinks, will be most interested in them and to solicit competitive bids from these buyers. With cattle suitable for only one of the two outlets, the competition will be from buyers of those kinds. With those suitable for either outlet, the competition of each class of buyers comes into play.

The products derived from the slaughter of cattle, the value of which determines the value of the animals, are beef and edible and inedible by-products, the most valuable of the latter being hides and tallow. Beef goes into consumption almost entirely as fresh meat and is a perishable commodity. The limit of the time it can be kept after slaughter is less than a month, and is as a rule more nearly two weeks. Therefore, it must be pushed into consumption rapidly and in about the same volume as it is produced. The inedible by-products, such as fertilizer materials, are not as perishable and they can be held in storage without deterioration to be disposed of as merchandising policy may determine.

Relative Beef and By-Product Values

The relative value of the beef and by-products differs as among different kinds and grades of cattle. The greater the

beef value is to the total products value, the more the live cattle price will be influenced by variations in the price of beef. As the values of by-products are much more stable than are the prices of carcass beef, it follows that the greater the proportionate value of the by-products to the total products value, the more stable will be the values of the cattle, but with all cattle the carcass is the most valuable of the products, and therefore the price of beef is the most influential factor in fixing the price of cattle.

If all cattle were bought for slaughter as they are marketed, and none were sent back to the country, and the marketings continued as at present, the seasonable slaughter and production of beef would show great variation at different times of the year. Under such conditions the consumption would have to vary in the same proportion, with a consequent great difference in seasonable prices, or a part of the heavy production would have to be carried to the period of short supplies.

Packers Aid in Equalizing Supplies

To a certain extent this is done. While the equalization of the seasonable supplies is brought about largely by the cattle producers themselves, the packing industry assists in this by accumulating surplus supplies during the fall months and disposing of these during the period of reduced marketings in the spring. Storage supplies of beef are listed under the heads of frozen beef, cured beef, and of that in process of cure. Considerable amounts of beef are included also under the name of miscellaneous meats. This surplus storage is practically all in the form of frozen beef. There is also to be noted a continuous yearly demand for cured beef. This goes into cure and out into consumption each month without great change in the monthly stocks, and so these are simply the merchandising stocks. There are also merchandising stocks of frozen beef always on hand for use in certain channels of trade.

Beef that is frozen is usually of an inferior quality, and the surplus stocks are accumulated to meet a demand for this quality of beef during the spring months, when there is always a smaller proportion of inferior killing cattle in the receipts. Beef from good and choice corn-fed cattle is never frozen, except under very unusual circumstances, and does not go to make up the surplus stocks. Such beef goes into immediate consumption. The frozen stocks are very largely made up from western or range cattle slaughter, and much of it is in the shape of frozen cuts rather than in carcass. During the latter years of the World War much larger stocks of frozen beef were accumulated than is normally customary. This was to meet the overseas shipping requirements. Ordinarily the quantities going into surplus storage do not amount to more than 2 per cent of the annual production, but during the fall quarter this amount may run above 10 per cent of the monthly production, for one or more months.

Effect of Surplus Storage on Price

To the extent that the surplus storage takes supplies out of the market during the period of largest slaughter of cattle and largest production of beef it tends to hold at a higher level the price of beef and, therefore, that of cattle. It affects mostly the grade of beef that makes up most of the storage, and consequently the kind of cattle from which this is derived, but its influence probably extends to all cattle and all beef. When this surplus is pushed into consumption it has the opposite effect, restraining the price of cheaper grades of beef and the cattle that furnish these grades. However, as this beef is distributed through rather restricted channels of trade, it is probable that the effects of the movement out are much less, both on beef and cattle prices, than are those of the movement in, and it is true also that the out movement is spread over a much longer period of time than is true of the accumulation.

Effect of Export upon Price

Before the recent war, the export of live cattle and of the products of cattle slaughter had almost ceased. The principal meat products exported were various derivatives from tallow. The exports increased progressively during the war, until 1918, in which year they were nearly 775,000,000 pounds, or over 12 per cent of the total commercial slaughter. This, however, did not include supplies sent abroad to the American armies. During 1919 the exports were maintained on very nearly the same scale, being 11 per cent of the commercial production, but with the close of that year they fell off rapidly, being only 5 per cent in 1920, and there was also a small movement of live cattle for export.

The effect of the export of either live cattle, or of beef products, is to reduce the amounts of these products that must be pushed into domestic consumption. Therefore, it acts in such a way as to hold the domestic price at a higher level than would otherwise be possible. The export of live cattle especially acts to support the price of the limited kinds of cattle from which these supplies are drawn.

There is no possibility of determining for any considerable period of time whether there is any correlation between the stockyards receipts of cattle, and the prices of cattle either for a single market or for all markets combined. The recorded prices of cattle are for many kinds, ranging from canners to choice yearling and heavy beeves, while the receipts are all lumped together under one figure with no attempt to determine the numbers or proportion of different kinds or grades. Neither the short- nor long-term price movement for different kinds or grades of cattle is in the same direction. On the same day's market, or over a monthly period, prices of some kinds may be advancing, prices of others may be steady, and of still other kinds declining. So without knowledge of the numbers of the different grades, it is impossible to try to determine correlations.

Short-Time Receipts and Prices

In general it may be said that disproportionately large short-time receipts of cattle, both daily and weekly, result in price declines; that disproportionately small receipts are followed by price advances. Disproportionately means, in this connection, a considerable variation from the average of the receipts for a given season. The larger the proportion of a given kind of cattle to the total receipts at any period, the more exactly will this statement apply to that kind. During the spring season, when the proportion of long-fed cattle is the largest, the more will the prices of these be affected by disproportionate receipts. Similarly in the fall, with range cattle, the prices are affected by the size of receipts, although the double outlet of so many of these tends to lessen the effects of disproportionate short-time receipts.

It is to be noted, also, that disproportionate distribution of the seasonable supplies among different months of the season results in fluctuations in the price range. For example, if the range movement is poorly distributed, it will cause considerable differences between the price level prevailing during the periods of excess and small supplies. The same result follows the disproportionate distribution of the fat cattle supplies during the spring and summer seasons.

Seasonable Distribution of Receipts

The distribution of cattle receipts may be termed as seasonable, within the season, weekly, and daily.¹ The seasonable distribution is largely determined by conditions within and without the industry that are not subject to control or to great modification. The distribution within the season covers the manner in which the seasonable supplies come to market, and is connected with the daily and weekly fluctuations. The daily distribution is concerned with both the relations as among different days of the same week and of the same day in consecutive weeks. Weekly distribution deals with the weekly

fluctuations over periods of a month or so. It is the three short-time distributions, which involve the fluctuations in receipts, that mostly affect fluctuations in price, and it is with these three that plans for any more orderly distribution must be concerned.

Since beef goes into consumption largely as a fresh meat and, therefore, a perishable product, the volume in which it passes into the wholesale markets corresponds quite closely with the week's volume in which it is slaughtered. The weekly slaughter follows in volume, although not in similar volume, the weekly marketings of cattle. For this reason there is little opportunity for controlling the movement of beef into consumption, in order to equalize it over considerable periods of time. The daily, and to a smaller extent, the weekly volume are all that can be equalized in the distribution of the beef. For this reason also packinghouse beef operations are on a weekly or biweekly basis, and wholesale beef prices are fixed at that level at which these periodic supplies can be sold. It is plain then that any improvements in the distribution of beef must come from a better market distribution of cattle and cannot come after the cattle have been slaughtered.

Daily Fluctuations in Receipts

The daily distribution both as between similar days of different weeks and different days of the same week shows very wide fluctuations. Among the different days of the week, Monday and Tuesday are the worst offenders at most of the markets. At all the seven largest markets the Monday's receipts are disproportionately large, running as high as 39 per cent at Kansas City, and averaging 35 per cent at the ten leading markets for the year 1919. Since this situation has prevailed for years, the various interests at the market have more or less adjusted themselves to the situation, but it is certain that it makes really efficient operation impossible, and thus increases marketing cost.

This Monday situation is made worse by the tendency of a disproportionate number of excessive weekly runs to come on this day. The desire of both railroads and shippers to make use of Sunday as a day to move livestock to market and the general prevalence of Saturday as the marketing day among farmers are very largely responsible for this situation. Taken as an isolated case it is possible that a general balance of the time saved by farmers and railroads, against that lost by marketing interests, would not show a great deal of difference, but it is not an isolated case, as it is involved in and is an important factor in the general market situation which determines the value of livestock. These excessive runs in the weekly receipts have a depressing influence over the first half of the week's business and often over the whole week. They are sometimes given undue importance as a means of indicating the probable weekly receipts to come. Their probable ultimate effect on the beef market is overrated as a rule, and the tactical position of packinghouse buyers is unduly enhanced.

Fluctuations in Beef to be Marketed

Variations in the weekly receipts means a fluctuating volume of beef that must be worked into consumptive channels. Wholesalers and branch houses aim to clean up their supplies at the end of the week, and it is often difficult to move even a small surplus, except at a considerable shaving of prices. Therefore, supplies in excess of the normal demands of the market have a disproportionate effect on price. The branch house manager with a surplus supply of beef is in the same tactical position as a cattle salesman with a few too many loads of cattle, and buyers in both situations are quick to take advantage of their positions.

Since beef must go into consumption within such a limited period of time, it follows that the distribution of cattle within the season must result in a very similar proportionate distri-

bution of beef. Price is the controlling force in the distribution of beef. If the supply is short in relation to demand, the price goes up to a point where the demand is checked. If the supply is excessive, the price goes down to a point that will move the accumulation. In either event the situation is reflected back into the livestock market and influences the price of cattle. If the distribution of cattle supplies during the season is uneven, the supplies of beef are similarly uneven, and there is a change in the price levels of both at different periods. This change in the level is different from the short period fluctuations in both, and it shows the interrelationship between the beef and cattle markets more exactly than do the short-time fluctuations.

Packer Relation to Cattle and Product Prices

The price that slaughterers will pay for cattle is limited by the prices of the beef and by-products. In the disposition of the beef they are slaughterers and distributors and the commodity does not undergo any manufacturing change. The turnover is rapid, and the aim is to secure a profit above cost on the two operations. Changes in the selling price can be quickly reflected in the buying price of the raw material, and in this way the speculative element is largely eliminated. For these reasons the slaughterer has no primary interest in the levels of prices either for beef or cattle. His main motive is to maintain a relationship between the two prices that will guarantee him a profit. It is true that, when the cattle are slaughtered, he tries to get as much as possible for the beef and to that extent is interested in prices, but whether what he actually gets is more or less than he anticipated, the change is quickly thrown back to the price of cattle. Because of the uncertainties of both supply and demand, it is impossible to operate so as to secure a fixed margin above cost, and the daily operations over a period will show losses, large and small, and profits, large and small, but on the whole a profit.

With by-products the packer is in addition an accumulator and a manufacturer. He is an accumulator largely with hides, and a manufacturer with tallow products and offal. While there is some speculative interest involved in these activities, it is not the same in kind or degree as that involved in the accumulation of large stocks during a period of heavy production to be carried for distribution during periods of reduced supplies. His hide operations are not such as to lead the packer to wish to depress the cattle market so as to get his hides cheap, but he rather figures hides at their current value in estimating the value of cattle. The speculative element is in the decision of the packer's hide department as to whether to sell at the current price or to accumulate. Over periods of time he is not greatly interested in the range of hide prices.

Western Cattle Marketing Cycles

To turn to western cattle, the problem involved in the marketing of them is a seasonable one, covering a period of 15 to 17 weeks, beginning around the middle of August and lasting to about December 1. The movement of cattle in the Southwest, Texas, Arizona, and New Mexico, is a separate one involving a spring as well as a fall movement, and goes through different channels and for different purposes. Therefore it should be considered as separate from the western movement. The immediate problem is that of the marketing of the western or range cattle that go through the seven or eight great livestock markets of the Middle West, including Denver.

The line of division determining what shall be considered western and what range cattle, is a difficult one to draw by state lines. This is due to the fact that some of the states on the eastern border of this production region are about evenly divided between the two types of cattle production—on the one hand an industry in and for itself, in which cattle production is the controlling element in the enterprise, and on the other a cattle production as an adjunct to general farming.

In a general way, the dividing line might be set at about the 100th meridian, or the line more or less flexible, east of which corn and wheat production is the determining element in farm practice, and west of which livestock—especially cattle—production is the leading factor. Perhaps another division might be made between the section where branding is the universal or very general method of indicating ownership, and those sections where ear markings or other methods of identification prevail. The states that are included in the consideration of this fall market movement are the northwestern and mountain states of Colorado, Idaho, Montana, Nevada, North Dakota, Utah, and Wyoming, and the border or semiwestern states of South Dakota, Nebraska, Kansas, and Oklahoma. In order to cover the entire region where branded cattle are produced, it would be necessary to add the three southwestern states and the Pacific states of Washington, Oregon, and California.

Importance of Branded Cattle Regions

The importance of the branded cattle regions in the total cattle production of the United States is indicated by the fact that over 50 per cent of all the cattle hides that go through tanning channels are branded. This fact shows that over one-half of the cattle—not including calves—that are ultimately slaughtered, had been calved in the branding regions, which is included within the 14 states above named, but the total area of which is reduced by the large areas in some states outside of the branding regions.

The only fairly complete figures as to livestock shipments by states are those compiled by the United States Bureau of Agricultural Economics for the year 1918. Eliminating the Pacific states from both figures, these show that some 353,000 cars of cattle and calves were loaded in the 14 states, out of a total for the entire country of 623,000 cars, the Bureau's figures being corrected by subtracting the loadings at stock-

yards markets in both cases. The 1920 census figures show much the same thing. The 14 states have 25,700,000 cattle of all kinds, or 38 per cent of the 66,800,000 for the entire country, and 19,590,000, or 55 per cent of the 35,424,000 beef cattle.

The conditions of production and the time and methods of marketing differ greatly in the different sections of the branded cattle region. Consideration here is limited to the marketing through the central markets, and only incidentally refers to the direct movement. The movement from the southwest breeding grounds to the northern ranges and to the Kansas and Oklahoma pastures, while it has an important influence upon the ultimate supply and movement, is apart from the general marketing movement through the great livestock markets.

These must be studied as large elements in the cattle production and supply situations, but they are different in both time and direction. These southwestern states also contribute to the fall movement to the central markets under consideration, but in a minor degree, for the great part of their supply goes through other markets, is disposed of through other channels, and can hardly be considered as competitive with the western fall movement. There is also one from Utah, Nevada, and Idaho to the Pacific Coast, which occasionally extends further eastward, but this is largely a direct movement and results from the comparative price levels prevailing, which make it more advantageous to ship in one direction or the other. It is of local rather than of general importance.

Fall Movement Determines Total Supply

From the standpoint of total available supplies of cattle, for the year, the fall movement is the most important, for it determines largely what the total seasonable supplies for the months following it will be. As a matter of fact, the marketings during the so-called "range season," the large part of which comes from the states under consideration, determine

in large measure the marketings and available beef supplies of the following winter, spring, and summer months. These are from the states in which the large increases or decreases of production take place, and where the greater part of the changes in the margin of supply occur.

The charted movement to the seven principal western markets for the past seven years, by months and by seasons for the crop year, shows that the receipts for the first three months, September, October, and November, make up each year almost exactly 35 per cent of the year's totals. They also show that the numbers coming in the following seasons bear a rather close relation to these, and that the seasonable variations in numbers correspond to those of these three months.

The reason for this is fairly plain. The marketings from the states that furnish the year-round supplies of these markets is more or less constant, the sources from which these come not varying greatly from year to year. The variations in supply are due to the numbers of stocker and feeder cattle brought into these states, and these come largely from the western cattle states; for these three months are not only the months of largest total marketings—32 per cent—at all markets in the country, they comprise also 40 per cent of the total movement of stocker and feeder cattle.

Fall Cattle Surplus Disposition

In actual practice this big surplus of cattle coming to market in the fall is disposed of in one of two ways. Considerably less than one-half—47 per cent for the seven markets, and much less than this at some markets, e.g., 21 per cent at Denver and 29 per cent at St. Paul—is bought for local slaughter at the market where it is received. Over one-third—34 per cent at seven markets, 44 per cent at Kansas City, 44 per cent at Omaha, and 60 per cent at Denver—are shipped back to the country as stocker and feeder cattle. The balance is either shipped to small local packers who seek their

supplies at these markets, or goes to make up the large volume of intermarket shipments.

Price Determination of Western Cattle

The determination of the price range of western cattle is due to the interworking of the demand from these two sources upon the fluctuating supply. A good many of the cattle have only one possible outlet—the killer. This includes many steers either too heavy or lacking quality for feeding purposes, northern-pastured, southern-bred steers being a type of these kinds, nearly all cows and all bulls. The value of these, to the killer, is determined by the current price of the derived carcass beef and by-products, in connection with his estimate of the probable value of frozen beef during the future months, when this is ordinarily worked on to the market. While the amount of frozen beef is only a small per cent of the total yearly production, it is a considerable element in the value determination of western beef cattle, as the supplies are largely drawn from this source.

Besides these cattle that have only one outlet, there are many other kinds that the killer can use equally well, and in the absence of another outlet he does use them. This other outlet is for stocker and feeder purposes. Their value for this purpose is the price prospective feeders are willing to pay, and this is based on their judgment as to the probable prices for fat cattle in the near or more remote future. This price must be at least as much as killers will pay, and as much more as competition among feeder buyers results in. The greater part of the stocker and feeder cattle are bought by traders, who sort them to meet the demands of actual feeders, and who carry considerable supplies of such cattle from day to day after they are sold out of first hands. They buy their stocks during the big runs of the first of the week, and dispose of them during the balance of the week.

Marketing to Meet Different Users' Demands

The marketing problem for these western cattle is to move the supply during the period when it must move in such volume as to meet best the demands of various users, but to determine what these demands are, or are apt to be, is a difficult task. With the feeder demand the conditions that greatly influence it—the size and condition of the corn crop and forage supplies—are not determined until the movement is well under way. With the demand for cattle for slaughter it is affected greatly by the simultaneous movement of competitive cattle from competitive regions outside the range territory. In a practical way, and for practical purposes, it will never be possible to estimate the demand situation with any certainty. The activities of western producers must be largely limited to trying to control the supply side—to moving the available seasonable supplies to market in a fairly uniform volume from week to week, avoiding, as much as possible, daily and weekly excesses.

The distribution of these western cattle, as among the markets to which they are shipped, is determined, in part by the transportation lines, and in part by the character of the market outlet for different kinds of cattle, the tendency being for cattle to seek the nearest market while moving eastward. Many of these cattle are shipped on a billing permitting them to be shown at one market, and, if not sold, to be forwarded to another, principally Chicago. A comparison of the daily and weekly receipts, during the time of the westward movement, seems to indicate that the weekly receipts tend to vary in the same direction, and in somewhat similar volume as among the larger markets, but with this tendency less marked with the smaller ones. It seems also, that excessive Monday runs are more apt to be individual market occurrences, rather than general with all markets. That is, the biggest Monday runs, for a given month, would not occur on the same date at all the

markets, or at the four larger ones. Ordinarily, difference in price is the force that maintains the relationship in receipts among markets, but with western cattle the conditions under which they are shipped, tend to minimize this influence. Whether a better distribution among markets than now results could be secured by other means, is a problem in the solving of which the first task is to try to bring about a better weekly and daily distribution of the total supply at the markets where the supplies from each section naturally go.

CHAPTER XXVI

CYCLES OF LIVESTOCK MARKETING—HOGS

Hog Production Concentrated in Corn Belt

Production of hogs in the United States is more concentrated than is that of any of the other species of meat animals, and the commercial marketing, by which is meant the movement out of the regions of production to the large livestock markets, or to large slaughtering establishments, is further concentrated. For the only year when figures are available, showing both the numbers in different states and the carload loadings in the several states, the year 1918, the 12 states making up the north central and west central groups yielded 59.2 per cent of the total hog production and loaded 88.3 per cent of all hogs moving in carloads. These two groups of states constitute the Corn Belt and the regions immediately adjacent to it. Within this territory also the production and commercial movement is still further concentrated, the five states of Indiana, Illinois, Iowa, Missouri, and Nebraska producing 40 per cent of the country's total, and furnishing over 60 per cent of the car loadings. These in Iowa alone made up 28 per cent of the total, after eliminating the loadings out of stockyards markets.

The hogs produced in this territory go either to the ten stockyards markets located there or close by, where they are sold for local slaughter, or for shipments for slaughter, or direct to packinghouses located within the territory, or within the surplus consumption regions. These ten markets receive around 70 per cent of all hogs passing through stockyards markets. The commercial movement in other sections of the coun-

try is negligible, and need not be considered as any part of the problem of hog marketing. The numbers produced there are almost wholly for local consumption, and are of importance only as indicating what may be the changing demand for packinghouse pork products from the surplus markets.

Hog Movement Is for Slaughter

The market movement of hogs is almost entirely a movement of animals for slaughter. During recent years there has developed a stockyards' trade in stocker and feeder pigs, but for the year 1920 this only amounted to 1.7 per cent of the receipts at all markets, nearly one-half being at the two markets of Kansas City and St. Paul. At these two markets the trade in stocker and feeder pigs constitutes an important part of the out shipments—around 33 per cent at the former and 40 per cent at the latter. These pigs come largely from outside the Corn Belt to be finished into market animals within it, and the trade in them has a negligible effect on the price of any other type of hogs.

Hogs shipped to the stockyards markets have two outlets: they are either bought for local slaughter at plants located at or near these yards, or they are bought for shipment to slaughtering establishments located elsewhere, or for shipment to other markets. The intermarket speculative movement is not important, and merely covers the purchase of hogs by traders at one market for shipment to another, to be resold there. A good many hogs are shipped in this way and thus are counted twice in the stockyards receipts. However, these are largely hogs shipped for slaughter direct, but which are included in the count at the market at the destination point. This accounts for the discrepancy between the total marketing and the total commercial slaughter.

There is a great difference among leading markets in the local slaughtering and shipping outlets for hogs. The demand from these two sources differs also at different seasons of the

year. For the year 1920 at all markets, 64 per cent of the hogs were bought for local slaughter and 36 per cent for shipment. The low month for local slaughter, September, took 61 per cent and the high months 67 per cent. The yearly percentages of local slaughter and shipments at the leading markets were as follows: Chicago 78 and 22, Kansas City 74 and 26, Omaha 73 and 27, East St. Louis 49 and 51, St. Joseph 83 and 17, St. Paul 85 and 15, Sioux City 59 and 41, Indianapolis 46 and 54, Buffalo 42 and 58, Pittsburgh 17 and 83, Fort Worth 80 and 20.

Direct Movement to Packing Plants

Besides the hogs that go through the stockyards markets on the road to slaughter, there is also a considerable volume that goes direct to packing establishments, or is assembled at concentration points for shipment direct. There are no reliable figures to indicate the importance of this movement, but in some states it has assumed large proportions and is apparently on the increase. The 1918 loading reports show that in Iowa the movement to local packinghouses and from concentration points was over one-third the movement to stockyards markets. If the movement to unnamed points is included, it brings a total of cars greater than the total loadings of any other state, Illinois excepted. In other states the situation cannot be arrived at, because of the very large movement of hogs from the stockyards markets located in those states.

Special Characteristics of Hogs

Hogs differ greatly from cattle and sheep as raw material for food production, that is, as market animals. The particular characteristics of hogs have great influence in determining the market situation and among these characteristics are:

1. The quality of the supply is quite uniform.
2. Quality is of minor importance as a factor in price determination.

3. Classification is largely on the basis of weight.
4. Possibilities of standardized grading and sale by description are considerable.
5. The greater part of the carcass goes into cured products, which are not perishable, and these products can be and are closely graded and traded in by grades.
6. The prices of these cured products fluctuate less than those of fresh meats and are more susceptible to control.
7. The value of the fresh meat products is a smaller element in determining hog values than values of other animals.

Fairly Fixed Relation between Hog Numbers and Slaughters

Hogs are the only species of meat animals with which there is a fairly fixed relation between the numbers in the country and the numbers to be marketed and slaughtered. As with no other species, hogs can be said to be produced as a "crop." The great bulk go for slaughter within 12 months from the time they are born. This is especially true of those produced in the great surplus region, but this crop year does not coincide with the calendar year, nor with the government's fiscal year, so that all statistics in terms of those years are misleading. The great part of the pigs are farrowed in the spring of the year, and are sold for slaughter during the following winter and early spring. There are considerable numbers of summer and fall farrowed pigs that go to market the following summer and fall.

Hog Crop Marketing Year Begins November 1

Practically all hogs to be marketed within the following 12 months are in existence on November 1 of each year. On that date only a very negligible part of the crop of the preceding spring has been marketed, and nearly all the production of the year previous has been disposed of. The size, condition, and probable price of the corn crop, which determines very

largely how a crop of hogs will be marketed, has been determined by that date. The cleaning up of old storage stocks and the accumulation of new ones normally begins at this time. All the important factors indicate that this date should be selected as the beginning of the crop marketing year, and that all estimates and statistics should accommodate themselves to this date.

On November 1, the supply of hogs from which the numbers to be slaughtered in the next 12 months will be drawn, consists in a general way of the following: About 5 per cent of these are made up of brood sows that farrowed in the spring and have not yet been fattened and marketed and of sows that have produced fall litters. A part of these will be prepared for slaughter and a part will be kept as breeding animals; about 85 per cent of young hogs farrowed prior to July 1; approximately 10 per cent of pigs farrowed after July 1.

One exception must be noted to the first of November situation, showing the crop marketing. There are always some late winter and early spring farrowed pigs that are pushed rapidly to maturity and marketed at an early age in the following fall before November 1. These will always be missed in any enumeration. Such of these as are shipped back to the country would come back within the crop year.

How Supply Is Handled

The supply on hand on November 1 will be handled about as follows:

A variable percentage, depending upon conditions encouraging or discouraging hog production, running from around 20 per cent to as high as 25 per cent, will be retained as brood sows and bred in November, January, and February. These will be made up of young sows over six months of age and of old sows, perhaps 10 to 15 per cent being the latter. A number that will be a variable percentage, but fairly fixed in itself, anywhere from 6 to 10 per cent, will be slaughtered for use on

the farms where raised, or for local consumption. The summer and fall pigs (estimated at 10 per cent) will be carried over until the next summer.

Of the balance, the total number, less brood sows, fall pigs, and home slaughter, a variable percentage, running from around 55 to as high as 70 per cent, will be marketed during the four winter months. The total numbers marketed during this season will show the greatest variations from year to year, for there is a very marked tendency for increased production to be moved during this period. What is left of this balance will be marketed during the next four months, the greater part of it before June 1, and at that time will begin the marketing of fall pigs and of brood sows. The balance of the crop, less the carry-over of brood sows and unfinished sows, will move in the last four months.

The inspected slaughter figures for the past ten years on a crop basis, show an average movement for the entire period of 42.9 per cent during the first trimester, varying from 38.8 to 48.7; of 32.6 for the second, varying from 30.1 to 34.3; and of 24.5 for the last, varying from 20.7 to 28.7. The movement during the first two periods follows the total yearly movement. During the last period there is no apparent relation to the total. This arises from the fact that conditions in the agricultural situation that influence production and movement, may be quite different for the part of the crop that is marketed first, and that which is marketed last. The latter part of the movement, being made up of fall pigs and sows, is determined by conditions and price situation of the early summer. The spring pig crop is determined by conditions of the early winter.

Relation of Corn Crops to Market Movement

As indicated, the market movement has been considered on the basis of three 4-month periods, beginning with November 1 of each year. Normally this represents fairly well the seasonable movement. In a general way the winter supply comes

from one type of farming, and this movement ends about the first of March. The second seasonable supply comes from a different group of farmers and a different type of farming. The last seasonable supply is the clean-up from all kinds of producers. This division also corresponds fairly well to conditions in the packing industry. The first 4 months furnish surplus storage supplies, the second show a fairly constant storage supply, and the third the movement of surplus storage into consumption. The monthly movement within the season, and to some extent the seasonable movement, are determined very largely by the size and condition of the corn crop and the prevailing relationship between the prices of hogs and of corn. If the corn crop is short, either in actual bushels or in comparison to the supplies of hogs, or if the price situation is unfavorable for hog feeding, the supply will move early both in the year and season. If the reverse is the condition the supply will move late. The corn situation influences also the cattle feeding situation, and this has an important bearing upon the hog movement, especially as between the first and second trimesters.

The price of hogs is determined by what the manufacturers of fresh and cured pork products will give for them as raw material. Their use value is their value as such raw material and is estimated on the basis of present and anticipated future values of derived products. The market price is what these manufacturers pay from day to day for the supply as it comes to market, and it is fixed by the competition of these users for the available supply. The principal factors in this value and price determination are current domestic consumption, storage, and export demand. The first two will be considered together as their influences on price are closely inter-related.

Effect of Storage and Consumption on Price

To understand the effects of storage and current consumption it is necessary to know how the products of hog slaughter

go into consumption. The great part of the hog carcass goes into cured products, the fresh meat parts being ordinarily less than 20 per cent of the whole. These products can be held in storage without depreciation in quality. Of the fresh meat parts large amounts are frozen, especially loins, and are carried from winter to spring and summer. The big movement of hogs to market comes in the winter months and the light movement in the summer, but there is a big demand in the summer for cured pork products, and the only way this can be provided for is by the accumulation of stocks during the winter for use in the summer. The accumulation usually begins in November, when the winter run of hogs starts, and the surplus stocks are cleaned up by the end of the following October.

At all times of the year there are large stocks of pork products on hand and technically listed as in storage. These are lowest at the end of the crop year, and are made up of meats in cure and a supply of cured meats for current use. It takes some weeks after slaughter before the products are ready for consumption, and the current daily product is added to in-cure stocks, and somewhat similar amounts are taken from cure ready for sale. These in-cure stocks and a suitable supply of cured stocks to meet regular demands are the ordinary merchandising stocks of the industry. They always amount to several hundreds of millions of pounds. The amounts on hand November 1 may be regarded as the regular stock, although the size may vary from year to year, depending upon the size of the late September and October slaughter.

Surplus Storage Stocks Equalize Supplies

Ordinarily the accumulation of surplus storage stocks begins in November, but in some years this may be delayed until the following months, due to unusual domestic demand, to large foreign shipments, or to the delayed start of the heavy movement of hogs. This accumulation continues during the winter months and makes up a variable amount of the total

winter production. For the past few years or so it has run from 450 to 550 million pounds and has varied between 11 per cent of the total winter production in 1916-1917 to 23 per cent in 1917-1918. It amounts to between 8 and 10 per cent of the total yearly production. There is sometimes an increase in the storage stocks and sometimes a decrease during the second trimester, but the stocks on hand at the end of June are usually fairly similar in size to those at the end of February.

The probable value of this surplus stock is the indeterminate and uncertain element in value determination. The regular stocks, as distinguished from this surplus, are like any other stock of merchandise with which price fluctuates up and down and may be expected in normal times to equalize themselves fairly over the year. If production were uniform throughout the year and there were no necessity for the accumulation of surplus stocks, the current prices for products would indicate the value of hogs as raw material. The turnover would be fairly rapid and the carrying risk would be slight. If hog products could not thus be carried, but had to be forced into consumption in volume corresponding to the marketing of hogs, there would be a great variation in the monthly consumption and also in the seasonable price. The chances are that if this were the situation, the production of hogs would accommodate itself to it, so that the supplies suitable for slaughter would be fairly equalized. As it is, storage does this and the packer and not the producer equalizes the supplies for consumption.

What Packers Can Afford to Pay for Hogs

With such a considerable part of the winter production going into surplus storage, the packer, in deciding what he can afford to pay for hogs, must take into consideration the prices he is realizing for the amount of his production, 80 to 85 per cent, going into current consumption, and the probable prices he can get for the 15 to 20 per cent going into storage to be

sold in 8 or 9 months, plus the cost of carrying these supplies. There is an interplay between present prices, the amount credited to surplus storage and future prices, that complicates the situation. The greater the amount going into surplus storage, the less will be the amount pushed into current consumption, and the higher the current price will be. The less the amount going into storage, the greater the amount forced into current consumption, and the less the current price. The more the surplus storage, the greater the future supplies and the less the probable price. And the less the storage, the smaller the future supplies and the greater the probable price.

The situation is also confused by the lack of knowledge of the supplies of hogs, and of the policy to be pursued by producers in marketing. Whether the movement will be heavy early with a light average weight, or late with a heavy average, resulting in a heavy production of light hams and bacon and less lard, and a small production of heavy meats and lard, or the reverse of this movement, with a consequent change in the character of the products, are problems that have to be considered.

During the winter packing season the price of hogs is determined by the competition of packers for the supply of hogs for current use and for storage uses. This competition is for the profits that current operations show, and for the speculative profits of storage. The packers thus play the triple rôle of slaughterer of fresh meats, manufacturer of cured meats, and carrier of supplies for future use.

Spring Consumption Equals Production

During the second trimester, that is, from March 1 to June 30, pork products are pushed into consumption in about the same volume as they are produced. In other words, supplies are drawn out of the storage reservoir in about the same amounts as they flow in, but in the fluctuating daily and weekly volume of the in-flow. Both the production and consumption

during this period run quite close to one-third of the yearly total over a period of years, and the monthly consumption within the period varies about as does the production. The price of hogs within this time, then, is determined almost entirely by the prices that are being realized for the derived products, as they go into current use.

The price of hogs during the last trimester, from July 1 to November 1, is determined by the prices at which current supplies and storage stocks of pork products can be worked into consumption. These storage supplies are competitive in quality with those of current manufacture, except frozen pork, which is discriminated against in comparison with the fresh article. They make up a very considerable part of the total going into consumption, and comprised in 1917 around 25 per cent, in 1918, 19 per cent, in 1919, 20 per cent, and in 1920 nearly 30 per cent. They have been accumulated to meet an expected shortage in current supplies, due to the reduced marketing of hogs, and they must be moved during this period, and stocks reduced to normal, before the start of the following season of heavy marketings.

Because of the small number of hogs slaughtered during this period, and the big movement of storage products, the percentage of fresh pork to the total consumption is the smallest of the year. For this reason the demand for, and the price of fresh cuts and especially of loins is of more importance in determining the price of hogs than at any other season, although the supplies of frozen loins tends to limit this.

Effect of Export on Hog and Product Prices

The export movement of pork products has much to do with determining the domestic value of these products and, therefore, the market price of hogs. During the past ten years or so, the amounts exported have varied between 15 and 36.5 per cent of the total production going into interstate traffic. Normally these exports go in a fairly uniform monthly vol-

ume, varying somewhat according to the monthly production. The United States has had in the past a virtual monopoly of the surplus supplies of most pork products, and the foreign demand in excess of the local supply must be satisfied by imports of American products. There has been a constant demand from these foreign sources and the export movement became an established element in the business. The greater or less amount of this movement affects materially the domestic price of pork and also the price of hogs. The greater the amount going for export, the less is the amount available for domestic consumption and the higher the domestic price. The less the amount exported, the greater are the domestic supplies and the lower the price, and while the export movement thus affects the domestic price inversely, the domestic price in turn affects the foreign demand. In a way the amounts exported are determined by the merchandising policy of the packing interests.

During the first two trimesters, that is from November 1 to June 30 of the crop year, the price realized from foreign sales must be practically equal to what the same supplies could be moved for in the domestic market, since any falling off in the price of products will be reflected back into the hog market. During the last trimester, that is from July 1 to November 1, when the surplus stocks must be cleaned up, it is possible to sell for export at less than the domestic price, in order to remove too heavy stocks that are apt to depress the domestic market. This amounts to holding up the domestic price by means of a foreign outlet for a surplus—not an unusual business policy. The export demand and movement during the packing season also may have an effect in influencing the estimated value of hogs for storage purposes, because it is an indication as to what will be the foreign demand during the season when these stocks are cleaned up.

Just what the effect of the export movement is upon domestic prices there is no way of measuring. Undoubtedly the

demand for pork products is more elastic than is that for some other kinds of staple foods, and for that reason price changes affect consumptive demand, but even so, it is probable that a reduction of one-third in exports, amounting to from 5 to 10 per cent of the total production, would have a considerably greater proportionate effect on domestic prices.

Packers Prefer Stable Hog and Product Prices

The packer, as a slaughterer, butchers hogs and sells a part of the carcass at once as fresh meat. As a manufacturer, he takes the greater part of the carcass and places it in cure to produce more or less non-perishable commodities not ready for consumption until the process is completed. As a surplus carrier he accumulates supplies of either cured or frozen products during the period of heavy production, and carries them to the time when production is small, thus equalizing supplies and consumption and also prices throughout the year. In his first capacity, and largely in his second, he is a manufacturer and merchandiser, for he buys hogs as raw material, sells the resulting products, and makes a manufacturing and distributing margin to cover costs and a profit. As such, he is not primarily interested in price, but rather in adjusting the costs of his raw material—hogs—to the value of the products, so as to secure a profit margin. The more stable the prices of both are the better he can operate.

In this third capacity he is a speculative carrier of food supplies. As such he is primarily interested in price. He must buy his raw material low enough during the period when he is accumulating supplies, to make certain that he can sell these supplies later and make a profit after paying carrying charges. When the time comes for moving these supplies he is then interested in having a high price for products, for the higher the price the greater his profits. The activity is essentially speculative and involves considerable risks. Many things may affect his chances of profits. Prices during the accumu-

lating period are mostly determined by the prices for current consumption, and conditions that may later change may keep these at a high level. During the period of distribution the prices for the then marketed supply of hogs are determined by those of products, and advances in products' prices increase the price of hogs, and also limit consumption, which may make it impossible to move the surplus.

The surplus may also be partly carried by hog producers through their keeping more hogs over into the later months because of the profitableness in feeding corn to them, and an unexpected addition to total supplies may be thus created. Or a larger supply of fall pigs and brood sows than usual may do this. In either case the increased supply prevents an increase in price. Large supplies of cattle and sheep and cheap beef and mutton may cause a falling off in the demand for pork products. Finally, the anticipated foreign demand may not develop, and larger supplies must be forced into the domestic market. In order to protect himself against these contingencies the packer seeks to depress prices during the winter, and he bears the hog market. To stimulate prices of products during the summer, he bulls the products markets.

No Exact Correlation between Receipts and Prices

There is no exact correlation between receipts of hogs and their prices over either shorter or longer periods of time. The nearest correlation is that of seasonable receipts and seasonable prices. These are lowest during the season of highest receipts and highest during the season of lowest receipts. Not that the highest and lowest prices of the year come then, but that the average range is highest or lowest. The range during the middle season is between these. This correlation between seasons of biggest receipts and lowest prices is emphasized by the fact that in years when unusual production conditions have reversed the ordinarily seasonable volume, the range of prices has shown the same change.

Among the different months the correlation is the greatest between the months of lowest receipts and highest prices, usually September, and the month of highest receipts and lowest prices, usually January or December. For the other months there is no discernible correlation. There is no certain correlation between the weekly receipts and corresponding weekly prices, although the tendency is for prices to decline on big receipts, proportionately large for the year and month, and to advance on small receipts. The same holds true as between daily receipts and prices, except that for the greater part of the time daily receipts excessive for the time of year, result in declines and are deficient in advances.

What Will Better Marketing Do?

If there is, then, no close correlation between receipts and prices, what are the results that may be hoped for from a better market distribution? Before this question is answered some consideration should be given to the conditions that determine the present distribution.

The seasonable movement is largely determined by conditions of production as outlined in the cycle of production and marketing. Variations in this seasonable movement from year to year are closely bound up with the corn price situation and the size of the corn crop. These cannot be controlled, and therefore, the seasonable movement is not subject to a great deal of control. The monthly movement within the season is influenced very largely by the individual farming practice and economy of the individual producers. To a considerable extent it is determined by the individual opinion as to the most profitable time to sell, which in turn is influenced largely by price considerations. To this extent it is possibly susceptible of limited control. The short-time movement, daily and weekly, is to a considerable extent fortuitous and is partly due to automatic price control. It should, therefore, be susceptible of control sufficiently to iron out a part of the larger fluctuations.

The most that can be claimed for a more intelligent distribution of receipts within these limitations is that it will tend to eliminate the present prevailing sudden fluctuations over short periods, and perhaps even up the distribution over longer periods.

Causes of Price Fluctuations

In this same connection it is well to consider some of the causes of these price fluctuations. Pork products do not go into consumption in the same volume as hogs are marketed, but are drawn out of the storage reservoir as merchandising policy makes desirable. Again, price fluctuations of cured products are not ordinarily abrupt or violent. Finally, the movement of these products into consumption can be made in an orderly manner. For these reasons, it would seem that hog prices should be fairly stable, and once seasonable adjustments have been made, the sharp daily and short period fluctuations, at least, would not be necessary. Therefore, the present price fluctuations in the hog market seem unnecessarily large and frequent.

All the causes for these hog price fluctuations are not easy to understand or explain. They arise in considerable part, apparently, from the methods by which hogs are sold in the open market. Instead of being a place where a staple raw material is distributed into manufacturing channels according to its actual value as such, it is more of an arena in which the two contending forces of buyers and sellers are engaged in a contest of trying to pull down or shove up the price level. It would seem they are often more interested in the game than in the performing of the function of efficient distribution. The presence of a large number of speculators in the contest, most of whom perform no justifiable economic function, tends to aggravate the situation by increasing rather than reducing the price fluctuations.

Another cause of these fluctuations is the too great impor-

tance that is given to each day's receipts as an element in the total supply situation. Excessive or deficient receipts of any day, or even of any week, are of almost negligible importance in the total supply. The products from 100,000 hogs when poured into the storage reservoir, will hardly raise the level of the supplies to a noticeable amount. In the absence of dependable knowledge as to the supplies of hogs to come into the surplus markets, it would seem that an exaggerated significance is given to the daily receipts by way of indicating what these supplies are. As these changes in daily and weekly volume of receipts affect packinghouse operations in the direction of making them less efficient, and as excessive receipts make these operations more costly, these price changes are justified to this extent, but this extra cost item is of minor importance as an element in present price determination practice.

Better Marketing and the Producer

From the producer's standpoint the result to be hoped for from a better distribution is the elimination of the present short-period fluctuations and the maintenance of a fairly stabilized price level. If these present fluctuations had the effect of rewarding greater efficiency in production, or more intelligence or energy in marketing, or of covering greater costs of production, an attempt to do away with them would not be justified. They do not, however, answer any such purpose. As far as the individual producer or shipper is concerned, they are entirely a matter of chance and do not stimulate any activity that ought to be encouraged. Whether their reduction would have the effect of raising the average price of hogs higher than it is now, there is no evidence on which to base an opinion. To the extent that better distribution makes possible more efficient packinghouse operations and reduced costs of handling at the market it should result in higher returns to producers.

As better distribution tended to reduce risks it should work

towards reduction of the handling margins of local shippers where these continue as a factor in marketing, but even without a higher level a more stable one is desirable. The great bulk of hog production is under fairly similar conditions and at a fairly uniform cost. Returns then should be as nearly equalized as possible and the chance element reduced to a minimum.

CHAPTER XXVII

CYCLES OF LIVESTOCK MARKETING—SHEEP AND LAMBS

Two Classes of Sheep Production

Sheep and lamb production is divided into two great classes, characterized by the names given to the respective products—native and range or western. In a general way, the regions of production are divided by the eastern borders of the Rocky Mountain states. All of the territory to the eastward contributes to the production of natives, and all that to the westward to that of western or range. The one exception is Texas, which should be included with the latter class because the methods of production and type of animals are more similar to the production of range than to natives. The nine Rocky Mountain states, including Texas, and the three Pacific states have about 60 per cent of the total numbers. The Corn Belt region and the states touching upon it have 25 per cent, and the balance are in the south central, southeastern, and eastern states.

Methods of production between these two regions differ greatly. In the western region the prevailing type is that of large bands herded on public or unenclosed lands, and operations are on a comparatively large scale. In the eastern region, it is that of small scale under enclosure. The former is distinctively an industry in and for itself. The latter is a part of a general or special farming activity.

In both regions two distinct types of animals are found—mutton sheep and wool sheep. These names indicate whether the main aim of the industry is either meat production, or wool

production. In the western region, however, there is this reservation, namely, that the great prevalence of Merino type sheep in the western region is also due to the supposedly greater adaptability of these kinds to the conditions of range production. Formerly, wool production was the mainspring of the industry, but with the development of a growing taste for mutton and especially lamb, conditions are tending more and more to a meat production basis, with wool as the by-product.

Slaughter and Feeder Outlets for Sheep

All sheep and lambs coming to market are potential meat animals for immediate slaughter, and this is the only outlet for the great bulk of the natives. For, with the exception of limited numbers of breeding ewes shipped back to the country, there is scarcely any out movement of native sheep or lambs for feeder or stocker purposes. Range stock has two outlets, either slaughter or return for feeding purposes, and the disposition made depends upon the kind and condition of the animals and upon the respective market demands. The greater part of this feeder movement is made up of lambs, and it comes in the late summer and fall months, while the range stock is moving. In 1920 at all markets the shipments of stockers and feeders made up around 22 per cent of the total receipts, and nearly 70 per cent of these went out in the five months from July to November, inclusive, and over 20 per cent in October alone. Of the total receipts, around 47 per cent were slaughtered at the markets where received, and the balance were shipped either as stockers and feeders or for slaughter. There is a very large movement to eastern points of fat stock for slaughter, and in 1920 Jersey City was the second largest slaughter point.

Market Classes—Sheep and Lambs

There are two great classes in the market receipts, namely, sheep and lambs. While there are no market statistics show-

ing the percentage of each of these, it is common knowledge that much the greater number are lambs. With them, grading is based on quality and condition, with some discrimination as to weight. For slaughter purposes there is no preference as to sex, but ewe lambs may bring a little higher price as breeding animals. Sheep are classed according to sex and age, and are graded as to quality and condition. Yearlings of both sexes sell together for slaughter, or for feeding, but with aged sheep wethers are preferred to ewes for both purposes.

Western lambs are divided into two general classes: slaughter animals and feeders. The division between these is based very largely on condition, and lambs have a "packer" and a "feeder" end. For feeder purposes, however, there is discrimination as among type or breeds and, to some extent, as among weights. Western sheep are bought either for slaughter, or for feeders, and in the case of ewes, for breeding purposes. For the first purpose, namely slaughter, quality and condition are the price-determining factors. For feeders and breeding, age and type are also influencing ones. There are no available figures showing the percentages of the western receipts that are slaughtered, or that go out as feeders. In 1920, during the months of the western movement, the shipments of feeders equaled 70 per cent of the total slaughter.

Cycle of Production and Marketing

Lambs are born in the first six months of the calendar year, and are marketed within twelve months from the time of birth. The period when the great part of the commercial supply is born is between March 1 and June 1, and these make their first trip to market within eight months of birth. Those born prior to March 1 are mostly marketed as a special commodity called "spring lamb," and move within four or five months from birth. June 15 marks the end of the time when spring lambs are separately quoted, and animals born the year

previous are considered as yearlings after that date. These spring lambs come very largely from the more southerly regions of production where the lambing season is early, and practically all of them go for slaughter.

The big movement of lambs, both native and western, starts about July 1, and this date might well be chosen as the beginning of the crop year. Starting there, the year can be separated into three seasons of unequal length: five months to December 1 being the season of grass lambs; December 1 to March 1, the season of Corn Belt farm-fed stock; and March 1 to June 30, the season of commercial feed lot stock. During the first season the movement is almost entirely of lambs that have been following their mothers, both range and native, and are shipped direct from pastures or ranges, with no further finish than that obtained from milk and grass. All the native lambs go for slaughter, and the range lambs partly for slaughter and partly as feeders. The percentage of range lambs going for slaughter is highest at the beginning of the season, and diminishes as the season advances. This fact indicates that the earliest and best lambs are sorted out and shipped first and the feeders come later. Some range states ship mostly fat lambs and others mostly feeders. The native lamb supply comes from all the regions where native sheep are kept, but especially from the Corn Belt and adjacent states.

The supply of lambs during the second season, i.e., from December 1 to March 1, is made up of fed natives and westerns from farm-fed lots. This supply includes many lambs out of cornfields that have never been fed in lots, especially during the first weeks of the season. It also includes fed westerns from feeding station lots and from other commercial feed lots. The natives are mostly fed by the growers who raise them, and the westerns are mostly purchased at the markets. The supply during the third season, i.e., from March 1 to June 30, comes very largely from commercial feed lots and

special feeding sections like Colorado and western Nebraska and a very large part of it is of shorn lambs. The supply is almost entirely of fed westerns. The numbers of fed westerns coming during the last two seasons is determined by the numbers marketed during the first season, and especially by the number of feeding lambs. Although there is a large movement of feeding lambs direct, the great part is through the markets.

No Fixed Relation between Production and Marketing

There is no fixed relation between the numbers of sheep in the country and the number of lambs or sheep, marketed. Nor would there be any fixed relation between these numbers in particular regions, if the numbers were available, and even if sheep were kept largely on a lamb production basis. The weather at lambing time has a big influence on the number of lambs grown, and these conditions change greatly from year to year. This is especially true as regards western breeding. Likewise range conditions, supplies of feed, the financial situation, and the tendency of the industry to expand or contract all influence the number of western lambs that will be shipped in any one year.

Sheep production does not follow any firmly fixed cycle. The industry, both native and western, is tending more and more towards a lamb rather than a wool production basis. Therefore, the supplies of wether sheep are declining, and mutton supplies are derived very largely from ewes. Ordinarily, ewes are kept until they reach an age when their reproductive capacities begin to decline, and flocks are culled each fall of fat dry ewes and aged ones, whose places are filled by selected ewe lambs. The percentage of ewes raising lambs, especially in range territory, varies greatly from year to year, and consequently the supplies of fat ewes in the fall. The numbers of these old and dry ewes to be marketed is determined by conditions in the industry, and the financial situa-

tion of individuals, and feed supplies. Financial and industrial conditions also influence the marketings of breeding ewes. If production followed its normal course, and met no disruptions from these conditions and from unusual winter losses, it is probable that between 15 and 20 per cent of the ewe supply would be marketed each year.

The Lamb Market Movement

The market movement of both sheep and lambs is largely determined by the conditions under which they are produced. Of these, the time of lambing is the most important. With natives, except with the limited number of large producers, the market supplies of both sheep and lambs are shipped at the same time. With westerns the same is also largely true, although often ewes will be held back for further grazing after the lambs have been weaned and shipped. The condition of pastures and ranges also acts to quicken or retard the movement of grass stock. In addition, methods of handling are quite a factor with westerns. The great bulk of these are run on mountain ranges in the summer, and the end of this mountain grazing season marks the start of the heaviest fall market movement, especially of feeding lambs.

The movement of fed stock is largely determined by the time when feeding operations are commenced. The time during which lambs can be profitably kept on feed is limited, as weight is a considerable factor in price making, so there is a fairly fixed relation between the beginning and end of the undertaking. With corn-fed lambs, weather conditions have an important bearing upon the movement. Some regular and most occasional feeders are not equipped to handle their stock in lots, and unfavorable weather tends to bring a big movement early while favorable weather tends to retard it.

If sheep and lambs came direct to market in volume as loaded at shipping points, the receipts would probably show greater fluctuations, both daily and weekly, than of any other

species. The use of feeding station pastures and lots as supply reservoirs has resulted in bringing about a well-controlled movement over short periods. It has not, and cannot, bring about a better distribution over the season.

Factors Determining Market Price

The current prices of sheep and lambs for slaughter are limited, and are largely determined by the current values of the consumptive products derived from them. Because of the value of wool, ordinarily the proportion of the values of the inedible products to that of the edible is the highest of any meat animals, and this gives the inedible by-products a greater influence in the determination of the live price. Mutton and lamb go into consumption almost entirely as fresh meat, and the volume of consumption follows closely the volume of slaughter. The consumption of these is much more restricted than is that of either pork or beef. The greater part of the commercial supplies are consumed in the Middle Atlantic and New England states and practically all goes into urban channels. It is, for this reason, more difficult to handle a temporary oversupply, and price fluctuations are greater and more frequent. Therefore, in spite of the equalization of daily and to some extent weekly receipts by the feeding stations, fluctuations in the price of the live animals, especially lambs, are also marked.

The prices of feeding stock are influenced very largely by the current values of fat stock, for these latter values are the only guides that indicate what future prices may be. They are determined by the competition of feeders for the available supplies, and the demand from these is largely based on the supplies and prices of feeds, profit and loss in recent operations, financial conditions, and the prices of other kinds of livestock. For the large number of animals that can be used for either slaughter or feeding, the feeder-buyer must pay at least the slaughter value.

Storage and Exports

The storage of domestic slaughtered lamb and mutton is not an important factor. It is not done to equalize supplies between seasons to any great extent. Such freezing as is done is to relieve a temporary situation, rather than to carry stocks. Storage stocks at their maximum are scarcely more than 2 per cent of the total yearly production.

There is no export movement of these products in any volume, and imports have always exceeded these exports. In 1920 there was a large importation of frozen lamb from New Zealand that was carried in storage for some months. A part of this supply was worked into the domestic market, but the balance had to be shipped abroad. Neither storage nor export have any great influence in price determination. Imports on the scale of 1920, if maintained, would probably have had considerable influence on prices.

Relation between Receipts and Prices

With sheep and lambs, as with cattle, it is hardly possible to establish any relationship between receipts and prices. Receipts are all lumped together under the name of "sheep," and prices are for different kinds and grades of sheep and for different grades of lambs. The spread in the price range between these is wide, and the amount and direction of price fluctuations are not the same. At the one time there are both native and western stock selling competitively on the same markets, but there is no separate enumeration. During the fed stock seasons there is better chance to fix a relationship because of the predominance of lambs in the movement. The restricted consumptive channels, and also the rather insistent demand from those channels, tend to cause declines and advances in price that are disproportionately large, following excessive or deficient receipts.

If all sheep and lambs went for slaughter and none were returned to the country, and marketings continued as at pres-

ent, it is probable that around 75 per cent of all the production would be slaughtered during the first season of five months. As it is, around 55 per cent of the total receipts come in those months, but less than 50 per cent of the slaughter takes place in the first season of a year over a series of years. The equalization of supplies throughout the year is brought about largely by feeding, and the great part of this is by the feeding of western sheep and lambs bought for this purpose. The result is that the supplies of lamb, and to less extent, mutton, are fairly uniform from month to month, the decreased numbers slaughtered during the winter and spring being offset, in part, by the heavier carcass yields.

Short Period Distribution

While the daily distribution within the week is fairly satisfactory, the weekly and monthly distribution shows considerable variations. This is especially the case during the grass movement. Whether this variation is due to movement of natives or of westerns, or is equally ascribable to both, there is no way of deciding, as there are no separate figures, but comparisons between markets that get large supplies of each and those that get mostly westerns, do not show great differences. It is probable that disproportionate receipts of natives have a more depressing effect on prices than those of westerns, because of the lack of the feeder outlet. During the movement of feed stock the fluctuations are greater while the farmed movement is on. This is due to the methods of operation and to the smaller use made of feeding station reservoirs. The best distribution is that of the commercial feed lot supplies of the spring. These move largely through feeding stations, and a real attempt is made to get them into the market in the most suitable volume. This is possible because of the limited number of producers and of the few selling agencies handling them.

Such in detail are the cycles of livestock production and

marketing, the factors influencing the market movements of each kind of livestock, the factors determining price, the questions of storage and export, and the relationship between receipts and prices. The next subject to be considered is the problem of orderly livestock marketing and what can be done to remedy the present unsatisfactory situation in marketing livestock, for it is certain that it must be remedied as has been recently stated:

One of the most pernicious causes of unrest and dissatisfaction in the past has been the prevailing unsystematic method of marketing livestock. There has never been any permanent efficient system regulating the flow of livestock to the market centers. . . . But stabilization of receipts will tend to stabilize values, and to prevent gluts, and consequent wastes, the elimination of which will operate to the benefit of producer and consumer alike.¹

¹ Wilson, Thomas E., "Mutual Problems in the Livestock and Meat Industry," address before the Annual Convention of the Texas and Southwestern Cattle Raisers' Association, Fort Worth, Texas, March 15, 1922.

CHAPTER XXVIII

PROBLEMS OF ORDERLY LIVESTOCK MARKETING¹

Defects in Present Marketing System

Perhaps the greatest weakness in the present situation in livestock marketing is that marketing takes place in almost complete ignorance of the supplies to be marketed. None of the factors in the industry, such as producers, railroads, market agencies, or slaughterers, have any adequate knowledge of supplies to come either in the immediate or more distant future. The only guide to probable numbers is the amount of the immediately past receipts and those during similar periods in other years. Admittedly, the securing of such information in an industry of such magnitude, drawing its supplies from so widely extended and dissimilar sources, would be most difficult, but in the lack of such information the whole industry works more or less in the dark, and long-view plans of handling either the animals or their products cannot be made. The risk element is thus made larger but, unfortunately for the producer, the other interests either do not share in this risk, or they are able to shift it back upon him. If production is too large, or is poorly distributed and prices decline, the effects of this decline are borne almost entirely by the producer, for his profits, alone, depend primarily upon the price of livestock.

A second grave fault of present methods of distribution

¹For use of material on which this chapter is largely based and from which information was drawn, outside his own personal observation and contacts, the author is greatly indebted to the courtesy of Mr. C. L. Harlan of the United States Bureau of Agricultural Economics, formerly of the Corn Belt Meat Producers' Association, and to the Farmers' Livestock Marketing Committee of Fifteen of the American Farm Bureau Federation.

is that no organized attempt is made to accommodate supplies of livestock to consumptive demand for meats. Animals are sent to market, are slaughtered, the products are pushed into consumptive channels, and consumption is forced to follow slaughter, especially with perishable products that make up a large part of the whole.

The controlling element in all the associated activities is the loading at country points and the resulting arrival of stock at the market. The railroads, stockyard companies, selling agencies, and slaughterers must carry on their operations according to this volume, and as this is a changing one, both as to days of the week, weeks of the month, and months of the season, each must be equipped to handle a peak of supplies for these different periods, which results in a labor and overhead cost unnecessarily high. To the extent that these variations in livestock supplies cannot be smoothed out in distributing the products, the prices of these latter must fluctuate to bring about a demand that will absorb the total with a resulting unstable price range.

A third defect is that there is no method by which temporarily excessive receipts can be checked by concerted efforts of shippers, but that this can only be brought about by price reductions. These occasionally excessive receipts are due, in part, to conditions developing in regions that contribute large supplies to seasonable movements, which accelerate the normal movement, but in great part they are due to chance, in that too many shippers decide to ship on a given day or in a given week.

Again, daily distribution within the week is very faulty and makes efficient handling very difficult. The tendency to make use of Sunday to move stock to market, and the prevalence of Saturday as a marketing day, results in much too large a proportion of the supply coming at the beginning of the week. This is especially true of stock shipped and accompanied by individual producers, and to a considerable extent

with that shipped through shipping associations that have set marketing days. The worst offenders in this respect are cattle shippers. In 1919, 57.5 per cent of the total weekly receipts of cattle for ten leading markets came on Mondays and Tuesdays.

Can Conditions be Improved?

To what extent these defects are susceptible of correction or improvement is a difficult question. It is possible that they are inherent in the conditions under which livestock production necessarily takes place, and therefore cannot be greatly changed. It is argued by some that the present practice with all its shortcomings has developed as being the best adapted to meet all the confusing conditions involved, but very few of such ardent apologists would go this far. Practically all factors admit the desirability of securing better knowledge of supplies; and also the evil effects of unequal daily distribution and of occasionally disproportionate receipts. It is generally conceded that less fluctuating prices over short periods would be a benefit. Of the various interests associated with the industry, those whose profits are least affected by these conditions are the ones most inclined to doubt whether present conditions can be improved. The situation is confused by the too prevalent tendency of different interests to lay the blame on some other. This lack of harmony, and the disinclination to give the whole question impartial study, have until the present time prevented any wholehearted attempts at improvements.

Co-operation Needed for Any Change

There is little possibility of any methods for the more orderly marketing of livestock attaining great success when they do not have the sincere and co-ordinated support of all the interests in the business. The probable success will be the degree to which such support is secured. This co-ordination

must be from the producer through to the retail distributor, including the railroads, yard companies, selling agencies, governmental agencies, and packers and slaughterers, both as such and as wholesaler distributors.

In this chapter it is proposed to consider in some detail the problems in the attainment of orderly marketing of cattle, hogs, and sheep. Following this survey, consideration will be given to the actual steps taken and plans evolved for the solving of the problem.

Orderly Marketing of Cattle

In working out an orderly marketing of cattle, it is well to discard at once any belief that the supplies of cattle can be so controlled and marketed as to hold the price at a given level. Without considering the changes in consumptive demand and their effect on cattle prices, this is impossible from the side of supply alone. During given seasons it must be accepted that there is a fairly predetermined number of cattle that must be marketed from the regions furnishing the commercial supply. The prices at which these can be marketed cannot be foretold by anyone, but will be determined by developing conditions as the supply comes on. Any attempt to control the supply to bring a fixed price, unless that price was fixed almost omnisciently in the knowledge of the changing demand to which the supply be adjusted, would have no possibility of succeeding, and would probably bring worse results than does the present automatic control.

A more orderly marketing cannot change the seasonable supplies except in a very limited way, but must seek to move them in a manner best suited to meet the requirements of the interests that buy them. Until the possibilities of estimating these requirements are much better based than at present, the best way to meet them during the season will be in moving the supply of different kinds in as nearly a uniform weekly volume as possible. In this way the interests that handle the cattle

from point of shipment through the market, and those that buy them, can arrange their respective activities according to this uniform volume. In connection with this equalization of the weekly movement, efforts should be made to bring about a better daily distribution within the week. At markets where the percentage of cattle going for slaughter is the largest, this will be of more importance than at those where the percentage of stockers and feeders is larger. This also applies as between different seasons of the year. The demand for the latter kind is not such a regularly recurring one as is that for the former, and the buyers are not supplying an efficiently operated industry where all costs are carefully estimated. The dealers in these regulate their purchases according to the estimated current demand and they must carry considerable supplies on hand to meet the demand as it occurs. Cattle for slaughter are all bought and plant operations and consumptive movement are determined by purchases.

The cattle situation in its larger and more general aspects has been dealt with, but for the purposes of considering the specific problems of orderly marketing, cattle cannot be handled in such a general way. The supplies of cattle coming to market are produced under widely different conditions and the marketing problems of the various kinds differ greatly. As it is an impossibility to consider all these separately, they are grouped under three heads, according to the three most generally prevailing methods of production, as follows: native beef cattle, native butcher and stock cattle, and western cattle.

Marketing of Native Beef Cattle

Under the head of native beef cattle are included, first, fed cattle, that is, mostly steers and yearlings, shipped from the corn belt regions and from other localized feeding sections, that have been fed more or less grain and shipped in car-lots and are suitable for the production of carcass beef. This head does not cover all cattle of these kinds, but only those

which are finished as products of a more or less separate feeding activity. The second class is that of grass cattle, which includes all other steers shipped from pastures within or without the Corn Belt, but not from the western or range sections. These grass cattle move in car-lots, and have not been finished on grain, but are mostly suitable for beef slaughter. Their production is more or less separated from ordinary farm activities.

The feeding of cattle, both on corn belt farms and in other locally important sections, is carried on for the making of a money profit out of this separate activity and in maintaining the fertility of the soil. In some localities the latter is the chief incentive, but with most Corn Belt feeders the former is the determining factor. It is in the direction of making a fair money profit more certain that the efforts of these feeders should be directed. The cattle feeder is essentially a manufacturer of an improved quality of beef, and his raw materials are unfinished cattle and various feeds of his own raising, which have alternative uses, and others purchased for this particular purpose. He carries on this activity in the knowledge that there is always a market for this kind of cattle, and in the hope that when his production is marketed it will realize a price to cover costs and a profit.

The unfinished cattle that the cattle feeder uses are partly grown by himself and partly bought in his own neighborhood. The greater part of them, however, are purchased at the stockyards markets and a large number are western or range cattle. Most of these are bought in the fall, to be fed on the crop then maturing, and are marketed during the following winter, spring, and summer seasons. The enterprise is carried on by a limited number of persons. These are more or less specialists in the business and, although the number thus engaged varies from year to year as does also the size of individual operations, the greater part of this production is the result of the annual activity of the same men, who have the necessary

equipment of plant and the ability for this purpose. This production also takes place mainly within a fairly limited region. A reasonable estimate would be that upwards of 75 per cent of them are produced in the region, including the state of Iowa and sections of adjoining states within 150 miles of the Iowa line. Possibly 40 per cent are produced in Iowa alone. A large per cent of these cattle are marketed through the Chicago market, the number being estimated by some as high as 75 per cent of the total, and a higher per cent of the better grades.

Functions of the Cattle Feeder

In carrying on this activity the cattle feeder performs two functions: (1) he buys a part of the surplus cattle that must be marketed in the fall and carries these to a later season when the supply is smaller, and (2) he produces a better grade of beef than can be secured from cattle off of grass, or that are carried along on a mere maintenance ration. While the performance of each of these functions involves considerable risks, the speculative element enters more largely into the former. The big risk in this first function is that too large supplies of such cattle may be carried over, or that the supplies of beef coming from other sources may be too large. The risk in the latter case is that the consumptive channels that take the greater part of this better quality of beef are of limited capacity, and that an oversupply of it will break the price to where it will sell for little more than the poorer grades, and the resulting price of the cattle will not cover the costs of finishing them.

While in actual practice these two activities are almost inseparably woven together, it is well to keep in mind that their respective objects are different. It may also be noted that in producing a supply of better quality of beef the feeder tends to reduce the success of his activity as a surplus carrier, for in adding quality he also adds weight, and thus increases

the actual pounds of beef for consumption. A large part of the difficulties of the feeding industry arise from the fact that in carrying the surplus and leveling up the interseasonal supplies of beef, cattle feeders have too often overproduced the better grades.

The cattle feeder differs from the general run of cattle producers in that his activity is a comparatively short-timed one. It requires several years so to increase the total production of cattle in this country as to enlarge materially the number coming to market. Reductions in the total production will be reflected only gradually in the marketings, but the number of cattle on feed, and especially the numbers going on feed, can be changed within a short period of time. The decision of cattle feeders to feed more or less cattle will be reflected within a few months in the market receipts of these cattle. Cattle feeders also differ from other producers in that they can determine the time of their activities and decide in advance the probable time of marketings. Actually custom and the availability of supplies of feed are very large elements in determining the feeding and marketing of cattle, but for a very considerable part of the supply, and enough of it to constitute the marginal surplus which will determine the price range, an intelligent effort to time the operation so as to insure the greatest certainty of profit, is the controlling factor. It is because of this comparative freedom for the play of the feeder's initiative that the possibilities of a better distribution are more promising with this class of cattle than with any other.

More Accurate Data Needed by Feeders

The object of the feeding industry is to make a profit by satisfying a demand for an extra quality of beef. This demand comes from the limited elements of the population that are best able to pay a good price for commodities they desire. The product from the slaughter of the better grades ordinarily goes through fairly fixed channels of trade, and is

handled by a limited number of distributors. The consumptive demand as registered through these fixed channels will take a limited amount at a comparatively high price, but any surplus above this amount that must be disposed of through other channels, weighs heavily upon the market and tends to bring the prices of these qualities to the level of the cheaper grades that go into more general consumption. The production of these better grades is essentially the production of an article of luxury. To secure this quality requires the uneconomic use of feeds in the sense that more actual beef can be produced by their use in feeding more cattle rather than fewer to such a high finish. Unless the consumers who demand this quality will pay well for its production it would be much better if it were not produced. Any artificial limitations placed upon its production in order to insure that what is produced shall bring an adequate price, cannot be considered in anything else than a favorable light.

Important as is the place of feeding in the cattle industry, statistics showing its size or any desirable details about it are for the most part lacking. It is one of the few important manufacturing industries that has not undertaken to develop a more or less reliable statistical basis to guide its members. The only specific information available is that secured for the Chicago market. This is interesting and valuable for the time it covers, but that has been too short to make it useful for other purpose than as a general index of the situation.

It does show how the different grades of fed cattle have come to the Chicago market at different seasons of the year and the percentages that the different grades make up of the total. It shows, for two years at least, how the numbers of these better grades have been concentrated within a few months. It also indicates the tendency among feeders to adjust their operations according to the price situation of the previous years—to reduce their production to be marketed during the periods that were unfavorable, and to increase it for the periods

that were favorable. In May and June of 1920 the total of good and choice cattle was 110,000, and in the same months of 1921 it was only 92,000, while the total in July and August, 1920, was 67,000, and for the same months of 1921 it was 96,000. During the earlier months of 1920 the price situation, due to excessive receipts, was not good, but during the latter months of the same year it was much better, so that feeders readjusted their operations in 1921, hoping that the same situation would prevail. The result was the defeating of their undertaking, however, because too many did the same thing. These figures also indicate the importance of different states in this industry, so far as the Chicago market situation can indicate it. They show also the importance of different classes of buyers, and thus the methods of distribution of different grades.

Feeder Cattle Status Differs from Others

Similar and more complete information of the same kind might well be secured for at least the three or four markets through which these cattle are largely marketed. Without it their market movement cannot be studied in its entirety, nor can even the comparative importance of different markets and different sections be determined. To supplement this, complete information ought to be secured as to the out movement of feeder cattle from the various markets and also available information obtained as to the interstate or inter-regional movement of feeders direct to feed lots.

Not only in the methods of production, but also in the manner of marketing, do these cattle differ from the bulk of the cattle produced in the regions from which they come. They are marketed in car-lots and shipped by the feeders themselves, who usually accompany the shipment to market. To a considerable extent, the operation is financed by the selling agencies that sell the cattle, and there is usually a very friendly relationship between the producers and the marketing

agents. There is no necessity for local marketing agencies at the point of shipment because of the car-lot production unit. These producers are, on the whole, quite well informed as to conditions and methods at the markets, and many of them are close observers of the market situation.

The methods of production, the manner of marketing, and the character of the product all indicate that these cattle constitute a fairly distinct commodity in the cattle supply. As such, it would seem preferable to plan their more orderly marketing on a separate commodity basis. In an industry so widely extended, producing such a variety of kinds and qualities and under such different methods and cost of production, there is no possibility of including all classes of producers within a single marketing plan. Consequently, wherever conditions make it possible, the commodity basis should be selected.

Double Problem in Marketing Fed Cattle

The problem of the orderly marketing of fed cattle is a double one. It includes both the direction of the production and the market distribution. These cattle come to market in greater or less volume every week in the year, and the number to come during a given time is determined very largely by the number started on feed at some preceding time. If feeding operations are commenced on a disproportionate scale at one period, there is certain to be a disproportionate supply to be marketed at another period. It will never be possible, nor would it be advisable, to attempt to limit the number of cattle to be fed during the year, since the conditions that determine this number cannot be controlled. It would be desirable, however, to limit the numbers of the long-fed, high-cost cattle that are produced, and this can only be done by influencing the production. In general, no attempt should be made to limit the activities of cattle feeders in their rôle of carriers of the surplus supply, but an effort should be made to limit their activities as producers of an extra quality of beef. Cattle are

being started on feed every day in the year, and fed cattle are coming to market all through the year. Any plan of orderly marketing must be first a plan of orderly feeding.

Data Necessary for Better Marketing

A plan of orderly marketing must include the securing of advance information of the supply to be marketed and a method of bringing about a controlled flow of this supply to market. This knowledge of the supply should cover the following points: (1) dependable information of the movement of feeder cattle, as distinguished from the stocker cattle, into the different states from the markets and also of the direct movement; (2) information as to the numbers and kinds on feed in different sections, the number to go on feed, and the probable number to be ready for market at different periods. In fact, these data should be as nearly as possible a continuous inventory of the feeding industry. Supplementing this, information should be brought together, giving rather complete knowledge of the supplies of feeds of different kinds, and the prices of these in different regions that are important sources of production.

Correlating this knowledge of the supply situation, information should be secured as to the probable demand. This would include information: (1) as to the consumption of the beef from these kinds of cattle, i.e., the channels through which different grades are distributed, and the industrial and financial conditions that influence this consumption, and (2) information as to the numbers of different grades coming to market at various seasons in the past, and the effects of changing volumes of receipts of different grades upon prices.²

² "During the past fifty years there have been unusual drouths and violent business panics. Nevertheless, in spite of all these outside factors tending to interfere with the evenness of the rhythm, there has been throughout the half century a continual tendency for cattle prices to rise for seven years until they reach the crest of the wave, and then to fall for seven years until they reach the trough. From the low point in '76 to the high point in '85, it took nine years, but from the high point in '85 to the low point in '92, it took seven years. From the low point in '92 to the high point in 1900, it took eight years, and from the high point in 1900 to the low point in '08 it took eight years. From the low point in '08 to the high point in '15 it took seven years, and

With this knowledge of the supply and probable demand as a basis, a marketing program could be worked out that would undertake to move the supply to market to meet best the consumptive demand. In a general way, this correlation could be brought about by determining the probable supplies available for given months and the past normal consumption for these months. If these were fairly equivalent, the supply should be distributed in as nearly equal weekly volume as possible, regard being given to conditions that might influence the demand for given weeks. If the supply seemed unduly large and the supplies in succeeding months somewhat deficient, efforts should be made to spread the apparent surplus over the following weeks. For the long-fed, highly finished cattle, the supply of which ought to be limited, information should be secured as to the approximate minimum demand for the quality of beef derived from them during different months, and the publication held at or below this minimum. In no other way can a price be realized for such cattle that will cover the costs of producing them.

again from the high point in '15 to the low point in '22 it has taken seven years.

"Are we going to go on for another year or two and make the downward trend this time eight or nine years? In view of the fact that the cattle population of the United States is now only 380 per thousand people, as compared with 600 during the period extending from 1900 to 1907, it would seem that we had probably reached the bottom of the trough of depression, and were now ready to start up again quite rapidly. From Texas, New Mexico, western Kansas, Colorado, Wyoming, and Montana come tales of shortage of breeding stock. In some cases, the shortage is presumably caused by drouth, in other cases by hard winters several years ago, and in other cases by the very severe liquidation which the banks feel that they have been compelled to enforce during the past two years.

"Perhaps some day, people will take our charts seriously and act accordingly, and then our charts will not any longer be good. The majority of people, however, are governed by mass psychology, and not by charts printed in *Wallace's Farmer*. And as long as this is true, it is likely that cattle production will swing back and forth in seven-year cycles. The cycles are seven years each way in the case of cattle because it takes about seven years after the stockmen of the country have been encouraged by high prices for them to expand their production sufficiently to have a serious effect on the market.

"When a shortage materializes, as was the case in 1900, it takes several years to save out from the stuff which otherwise would be sent to market the necessary surplus of heifer calves, and raise them and breed them so as to actually increase the producing power of the breeding herds of the country.

"While ordinarily the swing is about seven or eight years each way, we would not be surprised if the swing upward in 1922 would be much more rapid than in the past. Perhaps history will repeat itself, and the high point not be reached until 1929, but our guess is it will come much sooner than that. If business conditions permit we would not be at all surprised if the high point came in 1926 or 1927. Some of our friends from the west are even willing to predict that it will come by 1924 or 1925. We think they are a little optimistic, but it would seem that the man who has pasture and meadow land is safer now in borrowing money to buy good heifers than he has been at any time in the past ten years."—*Wallace's Farmer*, March 3, 1922.

Some Organization of Producers and Aid

To secure advance information as to production, but especially to bring about its orderly marketing, some organization of this class of producers around this commodity must be brought about. It ought to include all the regular feeders and as many of the occasional ones as possible. Its activities should cover the purchase of feeders at the markets, the direction of the time and length of the feeding operations, and the market distribution of the finished products. The control of the movement of these cattle must take place in the country, as their character is such that it cannot be made either en route, or at the market. Such control can only be secured by the organization of the producers themselves. Whether this organization should take the form of including the feeders of the entire Corn Belt under one head, or of state organizations each developing individual state programs of marketing and production, with an attempted correlation of these through some sort of federation, it is not easy to decide. A good case can be made for either method.

The ideal situation would be for the entire activity—the purchase of feeders, the starting on feed, the time of the operation, and the market distribution to be all under one control for the entire production. Practically, this is impossible. Within the realm of the practically possible it seems likely that more can be accomplished, at the start at least, through the organization of the feeders of each state and the development of individual state programs. If each state can bring about a better distribution of its production, the result will be much the same as if the entire distribution was brought under one head. Besides, some states have market outlets and methods of marketing that are not common to all, but which would have to be considered in the plans for those states.

How the desired control should be exercised, as to whether it ought to be by the furnishing of information accompanied by advice and request, and the result left to the automatic

working of these, or whether by actual contractual relations between the producer and the organization by which the latter is given authority to control a part or whole of the activity, it is equally difficult to decide. In the beginning it is highly doubtful if enough producers could be secured for an organization of the latter sort to justify the attempt. The more promising method is to make a start along lines that involve the least responsibility and which constrain the individual member's right of action the least. Then, as the organization can demonstrate its possibilities by actual results, and as it can develop the confidence and loyalty of its members, it can be modified and extended in the direction of giving it more and more control.

Marketing of Grass Cattle

The other type of cattle included under native beef cattle is grass cattle. These cattle come to market out of pastures both within and without the Corn Belt and may be either raised locally or simply outside cattle shipped in for a season's grazing and then forwarded to market. There are a number of limited areas where such production is the prevailing livestock activity, such as the Kansas and Osage pasture, the Mineral Point and adjacent districts, the Virginia and West Virginia blue grass regions. There is also a wide scattered production on a small scale to utilize smaller areas of rough lands situated in general farming regions, and a growing production to utilize cutover lands in timber regions. A part of this production closely resembles that of butcher cattle and another part is clearly an activity of itself.

These cattle are nearly all marketed during the late summer and fall months, and come in direct competition with similar cattle from the western and range country. They go both for killer and for stocker and feeder purposes, depending upon their character, weight, and condition. It is almost impossible to draw the line between many of these cattle and

fed cattle, especially where the latter are fed on grass. They are mostly shipped in car-lots by the owners, but to some extent by shipper buyers. There is no necessity for local marketing organizations to handle them.

Where there are concentrated production regions, as those above named, it is probable that their market distribution can be best controlled by a localized organization for this purpose. Such a local organization might be extended to include the assistance or direction in the purchase of the stocker cattle when these are brought in from the outside. These organizations would determine the number of such cattle to be marketed, and the time limits on the movement, and would then seek to move them in a uniform weekly volume as nearly as this could be brought about.

For the balance of such cattle, scattered as is the production and limited as is the community of interest among the producers, there seems to be no practical way in which the control of their distribution can be brought about. There is no possibility of determining the probable numbers to be marketed, and without such information no attempts at directing the distribution are justified. These cattle must be left to automatic price control, and under the conditions it is probable that this will work as well as any other conceivable method.

Marketing Butcher and Stocker Cattle

Within the next class, i.e., butcher and stocker cattle, is included all other kinds of cattle, not including westerns, that are marketed through the livestock markets, such as cows and heifers, bulls, light stocker steers, canners, and cutters of all kinds. With them might well be included, also, veal and stocker calves. These cattle are produced in large part either as a by-product of the dairy industry, or as a joint-cost product of a mixed farming activity. As for the former, the number to be marketed and the time of marketing are determined by the conditions in the dairy industry. As to the latter, they

are fixed by comparatively local conditions in the mixed farming business. The dairy industry from which they come, exists as both a highly specialized industry where dairy farming is the almost exclusively prevailing activity, and as a limited activity in the midst of a general farming section, in both of which dairy types of cattle are used. From this industry come the great bulk of the canner and cutter cows, cheap butcher cattle, cheap stocker steers of dairy type, and light-weight veal calves. From the mixed farming activity come the better grades of cows and heifers, butcher bulls, heavy veal calves, and the better stocker steers and some beef cattle in odd lots.

These cattle are largely produced in less than car-lots, and are either sold to local shippers, or are shipped by the owners through shipping associations. There is little hope of bringing about any better distribution of these cattle than now prevails. The numbers to be marketed have no relation to the numbers of cattle in the sources from which they come, for conditions other than numbers determine the marketings. With the dairy type it is both general and localized conditions in the industry, with the others it is general farming conditions and individual farm economy. What general control can be exercised will have to come through the shipping association movement, and at best this will always be quite limited. Because of the low price of these cattle, the prevailing high marketing costs are disproportionately heavy, and anything that will reduce these costs will be more beneficial than any possible results from attempting a different distribution.

Marketing of Western Cattle

Of the three methods of control of marketing western cattle, that at the loading points, or country control, is the only one that can bring about a better weekly distribution of the seasonable supplies. It alone can bring about a permanent improvement in the daily distribution, although, in emer-

gencies, a limited use of feeding station reservoirs might be made.

Such a control, applied to the western movement, would require that in advance of the opening of the range season, each state contributing to it should have developed a plan of car movement, or a weekly loading schedule, that would move the supply to go out of that state in as nearly equal weekly volumes as possible. Then it would be necessary for the various states to get together and, on the basis of the state schedules, prepare a regional schedule that would make such readjustments in the state movements, as to insure a fairly even total volume of western cattle going to market each week. Or, if conditions seemed to make it desirable, such a plan would enable the states to increase or decrease the volume of the early movement, by dividing the season into two parts, while trying to maintain an even weekly flow during each of the two periods.

Requirements for Control of Marketing

To put into operation such a plan would seem, according to many careful students, to require among other things:

1. A state-wide organization in each of the states, including within its membership the producers of most of the cattle going to the central markets. This organization should have authority both to perfect the plans for the marketing of the state's supply and to carry out those plans.
2. Information based on reports from the members, indicating, as accurately as possible, the number and kinds of cattle to be marketed with an expressed preference as to the time in the season when shipments should be made, this information to be secured a sufficient time before the start of the movement to be the basis of the program.
3. Arrangements for securing accurate information as to all conditions likely to affect demand at the markets

so that these may be taken into consideration in arranging the movement.

4. A close working agreement with the railroads that will bring about as nearly as possible a car distribution calculated to move the supply according to the program.
5. An association or federation of state organizations sending competing cattle to competing markets, which shall undertake to correlate the various state movements to bring about a uniform total movement.

This federation should have a permanent headquarters at some central point, such as Denver, which should be devoted to securing all possible information as to conditions of production, and to studying all the angles in the livestock situation liable to affect the markets for western cattle.

Existing Organizations Can Solve Problem

For most, if not all of the states included in this region, no new organizations would be needed. The existing livestock or cattle associations have a wide membership and have shown themselves highly efficient in carrying out some of the activities they now undertake. A competent marketing man would be needed as a permanent addition to the headquarters' forces, who should devote his time to the securing of the needed information as to supplies to be marketed, to perfecting the program for the movement, and to supervising its carrying out. The federation of the different state associations might well be undertaken either through, or under the direction of, the American National Live Stock Association.

Whether direct trading between the feeding sections and the western feeder producing regions should be undertaken as a promising element in a better marketing system, there is little evidence on which to base a judgment. That it brings satisfactory results in individual transactions does not necessarily mean that it would bring equally satisfactory results as

a means of disposing of the entire or even of a large part of the production, but if it is hoped to try it out on a large scale, the same organization of the western state producers as is here outlined will be necessary. It will have to be carried on as a state or regional enterprise.

Hog Marketing Problems

The problem of hog marketing is to move the supply to market within the limitations that are inherent in the condition of production, so that it can be most efficiently utilized by the industries that distribute the products. Marketing of hogs should seek to accommodate itself to the requirements of the packing industry rather than, as it does at the present time, to force that industry to accommodate itself to the market supply. The whole situation should be considered in the broad way of determining the most efficient, and therefore the cheapest way of getting the supply of hogs into consumptive channels. The part of the producer in this task is ended when he gets the hogs to the packer, and the distribution of the products is the problem of the latter.

This efficiency study should cover :

1. How to make the most efficient use of the local marketing machinery.
2. How to make the most efficient use of the transportation machinery.
3. How to make the most efficient use of the national marketing machinery.
4. How to make the most efficient use of the packinghouse machinery.
5. How can unnecessary marketing costs be eliminated and necessary ones, if possible, be reduced?

Each of these points involve separate studies to be carried on, preferably in conjunction with other factors interested, where there are such, or independently if need be. The orderly marketing of hogs must concern itself with both the

long-time and the short-time movements. The former will cover the seasonable and the monthly within the seasonable movements, the latter the daily and weekly distribution. As previously indicated, the conditions of production and the corn supply and price situations largely determine the long-time movements, and the possibilities of more intelligent direction are therefor limited.

Necessity of Dependable Statistics

A prerequisite of any attempt in this direction is the securing of dependable figures of the crop to be marketed.³ The United States Department of Agriculture is doing good work along this line through special semiannual pig surveys, the first being made in 1922. Until this is done there is no possibility of succeeding in any undertaking in this direction and none should be made. Knowledge of the size of the crop must be the basis of any attempted conscious control of its large movements. It is also indispensable before the packing industry can make a more intelligent distribution of the products, and the reduction in the risks involved in carrying surplus storage stocks can only come about through more intelligent distribution of the products. As these risks are largely shifted back on to the producer, anything that works to reducing them will be to his interest.

This information should be obtained as nearly as possible in terms of actual numbers and not by estimates. It should be secured prior to the openings of the crop year on November 1 and should be as nearly as possible the number on that date. It need not concern itself with supplies outside of the concentrated production region, and it should be the most accurate for the five states that furnish nearly 60 per cent of the

³ The National Agricultural Conference in its report, published in March, 1922, recommends this, and outlines in certain resolutions a plan for obtaining better statistics. Regarding statistics on hog prices, the ratio method of determining the cost of producing hogs, a mathematical study of supply and demand in the hog market, and predicting the future of hog prices, see Wallace, Henry A., *Agricultural Prices* (1920). Mr. Wallace is associate editor of *Wallace's Farmer* and gives some very interesting and valuable analyses from the producer's point of view.

commercial supply. To be of the greatest utility it should be secured in sufficient detail to show at least the numbers farrowed after July 1. If more detail could be secured, the greater the value. If a dependable basis for estimating the probable farm and small local slaughter can be established, then the difference will be the numbers that will go through commercial channels during the following twelve months, with the exception of a limited number of brood sows that will be carried over.

It is possible that if this information could be obtained for the five largest hog producing states, representing as they do most of the different climatic and industrial sections of the Corn Belt and the adjacent regions, and covering as it would such a large part of the commercial movement, this information would furnish a dependable basis for estimating the production for the balance of the region. At least if it will be possible to get the information only on a limited scale, it would be better to concentrate on the smaller area, and get it accurately, than to have it incomplete or unreliable for the larger area.

Knowledge of Supplies Aids Marketing

When the size of the supply to be marketed can be secured, then the conditions that will influence, if not exactly determine when this supply will move to market, should be thoroughly studied. This would include consideration of the size and condition of the corn crop in relation to the number of hogs in different states, the price relationships between corn and hogs, agricultural financial conditions, comparative numbers of cattle going on feed, temper of producers, etc.

With this knowledge of supply and of conditions influencing marketing as a basis, a marketing program could be developed. In the planning of this program all the interests in the industry should be consulted, and so far as possible it should be adjusted to meet the desires or requirements of each, and

thus secure the fullest possible support of each in carrying it out.

In simplest terms the problem would be this: There is a certain number of hogs to be marketed within the year. Conditions of production insure that approximately a certain number will be marketed during each season. Other conditions indicate that the movement within the season or as between seasons will take a given course. Within these limitations, how should they best be marketed to accommodate themselves to the most efficient operation of all the interested industries?

With such a program once decided upon, it will be the task of the producers to control the market movement in conformity with this program. There is no present ground for belief or hope that the multitude of hog producers can ever be so closely organized that the market movement can be centrally controlled according to any such agreed program. It is doubtful if any actual centralized direction of the movement will ever be possible, and it is questionable whether it should ever be attempted. Such control as will make the movement conform to the general outlines of the program will have to come, at the beginning at least, through the furnishing of dependable information, by means of advice and request, and such limited discipline as may be exercised over local marketing organizations.

Apparently, then, there is little to be expected in the direction of long-period control in the immediate future. This must wait upon the development of ways and means of securing the information, upon which it must be based. In the meantime, consideration should be centered upon devising methods to eliminate, or to minimize, the harmful effects of excessive temporary receipts and to effect better short-time distributing.

Methods of Marketing Control

Of the three methods of control, the reservoir method, or the control en route, and the market method seem to offer the

best chances of success in handling the hog situation. This means that instead of trying to control the movement out of country shipping points, this movement should be left to the present prevailing automatic control, and efforts should be centered in trying to minimize the effects of that movement after it has taken place, when it results in excessive temporary supplies being started for market.

Under present prevailing conditions at the stockyards markets, it is hardly possible that any organized handling and selling policies can be devised that would receive the needed support from the selling forces. There is too much individualism, jealousy, and self-pride. The belief in the infallibility of the personal judgment is too great, and the dislike of anything savoring of restraint is too strong. What limitations are imposed must be as nearly as possible automatically enforceable. One of the most promising of such limitations would be an agreement among the different interests at the yards—producers, commission men, yards company, and packers—limiting the number of hogs that can be offered for sale on any day's market, this number to be changed according to the season and the size of the movement. When this number has been confined in the selling pens, the balance of the day's receipts should be separately secured, and not placed in the selling pens until the following day. The carry-over should then be considered as a part of the day's receipts.

This would eliminate in part the necessity of speculators and traders to carry over the surplus which would go over in first hands. Salesmen would know that only so many hogs would be available, and would not be so apt to become panicky in face of excessive runs. Buyers would know that they would have to fill their orders out of a limited number. The supply of "seconds" would be greatly reduced. The market offerings of the different days of the week would be somewhat better equalized. There would be no chance of favoritism in the decision as to whose hogs should be carried over, and no sell-

ing agency could be subjected to criticism from customers whose hogs were thus carried over. The market and not individuals would get the blame for results. If, at the same time, an agreement could be reached between the selling forces and the packers, which would limit the amount of any day's advance, or decline, the present unsatisfactory situation would be greatly improved.

Reservoir Control of Hog Supplies

With this market control and supplementing it, should be undertaken some control en route. Concentrating at diversion points rather than at adjacent feeding stations promises better results in the hog situation. Much of the territory in the regions of largest production has a number of market outlets. As the excessive short-period receipts do not appear simultaneously at all these markets, if hogs are concentrated at strategic points, whence they can be sent to different markets, it makes possible a diversion to relieve the worse congested markets. With a considerable number of such yards of large enough capacity, in the event of a general congestion, hogs already loaded could be held there to afford a chance for a clean-up. The possibilities of checking additional country loadings from these points, provided they are controlled by the same interests that control the local shipping, would be much greater than would be attempts at checking from the more distant markets, or by a further removed authority.

Such concentration points will also be highly useful, if not indispensable, in bringing about changes in the present methods of marketing hogs. The present open-market method is entirely a consignment and sale-on-inspection one. From the seller's point of interest a consignment market is the poorest possible, and this situation is made worse when the commodity so consigned has to be sold at once or within a very limited time. Many commodities are of such a nature that they cannot be closely enough graded to make possible a sale by description,

and, therefore, must be consigned to be sold on inspection. Hogs can be graded closely enough for all practical trade purposes, and can be bought and sold on description. In fact, there is a large movement of hogs where this is the prevailing method. Different markets and different slaughterers want certain grades of hogs, and will pay a premium for such grades, but in the limited numbers going out from local shipping points it is impossible to make up carloads of different grades, and ship them to the most favorable markets. Local shippers who buy hogs outright sometimes do this by sorting the hogs bought and holding certain grades until a carload can be accumulated, but with shipping associations, at least under their present methods of doing business, this is impossible.

Shipping Associations and Reservoir Method

The only way that the advantages of this practice can be made available for shipping associations is by concentrating the hogs at strategic shipping points, and there grading them into straight carloads and sending the different grades to the best market. If efficiently developed, by demonstrated honesty and reliability in dealing, and with a considerable volume of business, such points can open up channels of trade that until the present have been largely closed to the shipping associations. Such points could also reduce considerably the transportation cost on hogs by using double-deck cars, and by sending eastern shipping hogs direct rather than through the stockyards markets. Not only should the aim of the organized shippers be to reduce terminal market expenses, but it should include also the reduction of all costs between the local shipping point and the slaughtering establishment. The more direct this movement can be made the greater the saving. A number of the large markets are rather points of reshipment than of slaughter, and as such can be considered as large concentration centers. It would seem that considerable saving in marketing costs might be effected by direct dealings between

the buyers who come or send to these markets, and the producers who ship to them, but to make this saving possible some kind of local concentration would be necessary.

The market situation of each state should be studied separately, with the aim of determining the best present market outlets and possible additional ones that might be opened. Then the necessary organization best fitted to meet the local situation should be undertaken. While the great bulk of the hog supply will continue to go through the stockyards markets, and these markets will continue to be the price-making centers, there is no convincing reason for the belief that this is the only method by which the hog crop could be marketed. If the ultimate goal of producers of various commodities is to develop methods of merchandising these rather than taking the position of forced sellers, then the tendency in the hog market will be away from the consignment market. It will be rather towards some method where the producer does not have to take all the market risk, and does not lose control of his product before it is sold.

Short-Time Movement Control and Country Loadings

The control of the short-time movement of the marketings of hogs will thus be sought in changed practices at the market, and by the limited use of diversion points both to check the flow and to change its course. But neither one nor both of these will be effective if they are not supplemented by reduced country loadings. At present the fall in market price is the check on these, but it is to avoid such sudden price breaks that these methods of control are proposed. They can only work to handle a very temporary situation, to give a chance to shut off the excessive supply at its source. To bring about the reduced country loading will require some limited authority over the local shipping associations, as they are the only local marketing agencies with any semblance of organization. The actions of local buyers and carload producers can only be influ-

enced by means of advice and request, but it is probable that pressure enough can be thus brought to check the local activities long enough to allow the market situation to be cleared. If not, the price check is the only one possible.

Marketing Control of Sheep

There are two distinct situations in the problem of orderly marketing of sheep that must be considered, namely, the movement of grass stock in the fall and that of fed stock during the other seasons. The former is complicated by being made up of both native and western supplies. The first requisite is better information of supplies coming to market. Natives and western should be separately enumerated. With both, the natives and western lambs should be counted separately from sheep, and the market disposition should be determined. Information making possible a complete study of the movement from these two sources during the grass season is needed.

The next requirement is for some method of determining supplies to be marketed. With natives it is doubtful if it will ever be possible to secure this with any exactness. Production is in such small units and the regions where it takes place are so far extended, that it hardly seems probable that either the numbers to be moved can be accurately learned, or that effective control of the movement can be brought about. In most of the states where production is of considerable importance, state sheep or wool growers' associations exist. Many of these have undertaken the direction, and some the control of the marketing of the wool of their members. They have fairly complete information as to the sheep producers of their states, and are in a position to secure information as to the numbers of animals to be marketed.

There are, however, many regular producers in each state who do not belong to these associations. There are numerous occasional ones also, particularly those who buy western ewes to raise one crop of lambs. Information as to these will be

uncertain at best. As most of this production is in less than car-lots, some local marketing machinery is necessary. The co-operative shipping associations are doing quite a bit in this line, especially in sections where sheep production is of considerable local importance. It is possible that the state associations working with the shipping associations might exercise a limited control of the movement, and that in certain important local districts a real marketing program might be developed.

Controlling Westerns Fairly Easy

The numbers of westerns to be marketed could be much more accurately learned and their market movement might be fairly well controlled. Production is on a large scale, and is in the hands of a limited number of operators. Likewise it is a separate activity on a commercial basis. The marketing is in large lots and is directed by men entirely familiar with market practices and conditions. The state associations of sheep producers are well organized and represent most of the production. It would seem highly fitting that they should extend their activities to include the direction of the market movement of sheep and lambs. The work should be developed and carried on along much the same lines as already outlined for western cattle. The state association should develop a state program of marketing, and these state programs should be arranged into a regional one under the direction of the Western Wool Growers Association. In addition to directing the movement through the markets, each state association could also develop direct trading with important feeding districts in feeding lambs.

The marketing of fed sheep and lambs involves many of the same conditions as that of fed cattle. The amount of production depends largely upon the movement of feeding stock during the grass season. The time of market movement is largely determined by the time when feeding operations are started. Therefore, any plan of controlled marketing involves

also one of controlled feeding. The movement during the winter season is mostly from farm lots and corn fields, with considerable contributions from commercial feeders. The first step in the direction of better distribution is full knowledge of the out movement from markets of stocker and feeder animals. This should include separate figures for sheep and for lambs, and feeding animals as distinct from breeding, the numbers going into different states and into special feeding sections, also something of the direct movement. Such information will give a good basis for estimating the probable supplies.

Best Methods of Control

With dependable knowledge of supplies the actual control of the movement can probably be best made through the feeding station reservoirs. This would require either the marketing through a single selling agency, or the presence of a representative of the feeders on the different markets to have general direction of the movement. Either of these would require some organization of feeders, the character of which would depend upon the activities undertaken and the authority delegated, but even without such a general organization the situation would be materially improved by better information, more harmony among market selling agencies, and by the formation of local associations in special feeding sections like Colorado and western Nebraska, to prepare and carry out programs of local feeding and local shipping.

CHAPTER XXIX

RECENT EXPERIMENTS IN LIVESTOCK MARKETING METHODS

Defects in Marketing and Remedies for Them

The main defects in the present livestock marketing system have been shown to be the following:

1. Marketing takes place in almost complete ignorance of the supplies to be marketed.
2. No permanent organized attempt has been made to accommodate supplies of livestock to consumptive demand for meats.
3. There is no permanent method by which temporarily excessive receipts can be checked by concerted efforts of shippers.
4. Faulty distribution within the week makes efficient handling very difficult.

The statement of these defects indicates problems to be solved which have been discussed at length in the previous chapter. Certain preliminaries to the solution of these problems were also suggested with the thought of presenting as many phases of the problem as possible, and fundamental conditions on which any constructive changes in the present marketing system must be based were outlined. In this chapter it is proposed to consider some methods that have been put into practice temporarily or otherwise, for the solution of livestock marketing problems. Following a discussion of these methods which have been put into practice for a time, certain comprehensive plans which have been formulated for bringing about a new phase in the marketing of agricultural products will be considered.

While these livestock marketing problems had been approached in one way and another for a long time, it was only after the outbreak of the Great War in 1914, that practical steps were taken for their solution. Of these the most important, and which will be taken up in this chapter, are the so-called "zoning system" to act as a stabilizer by establishing a 5-day livestock market each week, with the object of overcoming congestion at the yards and reducing delays and shrinkage in weight; and the wartime hog price control for the purpose of achieving price stabilization and preventing price declines disastrous to the meat producing industry. Special consideration is given to these methods, because any plans which are worked out in the future will have to be built on some basis of price control and a more even flow of livestock to the central markets.

The Zoning System for Stabilizing Receipts

The first of these plans to be considered here is the arrangement known as the "zoning," "sailing day," or "loading day" plan. This plan gave promise of producing at once a more nearly uniform distribution of livestock shipments. This was a necessity in safeguarding the food supply during the war, for the inefficient 2-day market was not suitable for those times of stress. For example, at Chicago for many years Mondays and Wednesdays were practically this market's only market days. Often almost four-fifths of the cattle receipts came on those days, leaving the remaining one-fifth to be divided among the other three days.

The origin of this institution of a 2-day market dates back to the time before refrigeration and the refrigerator car. As has been described in earlier chapters, much of the slaughtering was done in the East and exporting cattle on the hoof was also a big factor in the trade. It was desirable, therefore, to purchase early in the week at Chicago in order that shipments might reach eastern ports to be loaded on steamers leaving at

the weekend, and also for slaughter for the succeeding week's trade. The custom thus established became firmly fixed. Another factor was that the purchase of well-finished heavy cattle to be "koshered" at Jersey City continued to make the early days of the week favored spots, particularly for the shipment of good cattle, even until the last few years. This system, which had been in vogue for several decades, required no less an emergency than the war to break the shackles that bound shippers and stockyard agencies to the old plan, and bring into existence the zone plan of shipment of livestock.

"The zone system of loading livestock has put Tuesday and Thursday on the market map in Chicago," is the way one writer on the subject describes it. These days as well as Friday got their share of the receipts, and the leveling of the flow of livestock into the world's greatest livestock market had an effect that was national in scope. The undue fluctuation at Chicago caused by abnormal abundance having been mitigated, other markets have been stabilized to a large degree.

From time to time in the past individual efforts have been made to inaugurate the 5-day market plan, but the individuals who took the effort in good faith sustained losses continuously. The various circumstances which conspired to make Monday and Wednesday the better markets could not be overthrown. The shippers to Tuesday and Thursday markets were not rewarded by as keen bidding as on the two big days of the week. After a trial or two individual shippers, therefore, were disposed to avoid Tuesday and Thursday markets and the custom became more and more firmly fixed.

Evolving a 5-Day Market

The first effort by a neutral party to bring all agencies together to discuss a 5-day market plan was in November, 1915, when the Secretary of Agriculture directed the United States Office of Markets and Rural Organization to conduct a meeting with all interests represented. The thought was to get

the facts concerning the marketing of livestock, and to promote understanding and co-operation among the various organizations connected with the livestock industry. The master idea was, of course, to stabilize market conditions.

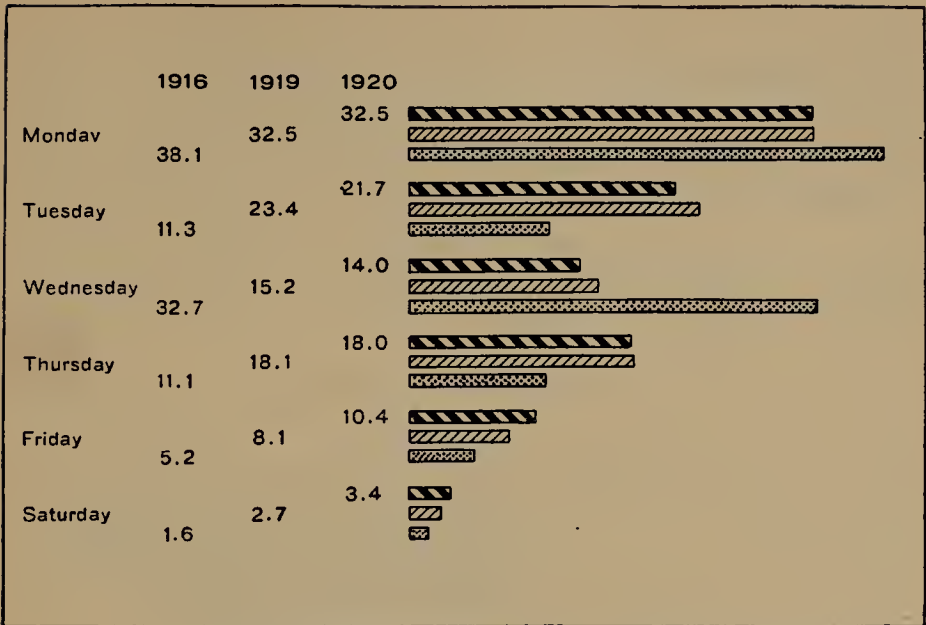
Producers, railroad men, packers, commission agents, and stockyard companies discussed the market jam which came on two or three particular days of the week. For years it had overshadowed all other problems and obstacles. Under the old feast and famine system, the railroads were called upon to provide an abnormal supply of equipment in the loading territory for the heavy movement. It was frequently necessary to rush the equipment back to the loading territory in special trains at high speed, in order to provide cars for the two big market days, while receipts for the remaining days of the week dropped to an abnormally low level. Such heavy movements on two or three days of the week congested terminals at the markets, taxed the resources of the stockyard and commission companies, and resulted in wide and sudden fluctuations in prices.¹

Results of Putting a 5-Day Market into Effect

From the conference grew the 5-day market. The new system was instituted in Chicago in December, 1917, by order of the United States Food Administration as a war measure to increase general efficiency in the handling of the future meat supply and to lessen economic loss. Almost immediately it brought about improvements in the distribution of livestock receipts that were little short of revolutionary.² Figures obtained from governmental sources tell the story. Comparing the month of February, 1917, for instance, under the old system, with February, 1918, when the zone plan was in effect

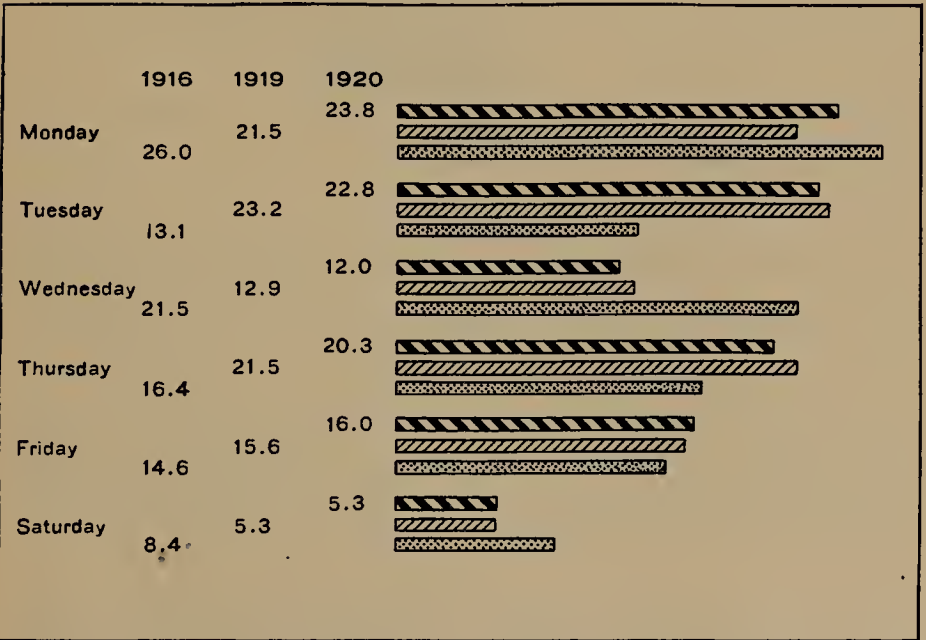
¹ This conference discussion was published as the Proceedings of the Conference relative to the marketing of livestock, distribution of meats, and related matters, held under the direction of Hon. David F. Houston, Secretary of Agriculture. The conference was conducted by the Office of Markets and Rural Organization (Charles J. Brand, Chief), Chicago, November 15-16, 1915.

² For discussions of this zoning plan, on which the present account is largely based, see the *Breeders' Gazette*, July 8, 1920, and *The Farmer*, July 24, 1920.



Courtesy Commercial Research Department, Swift and Company

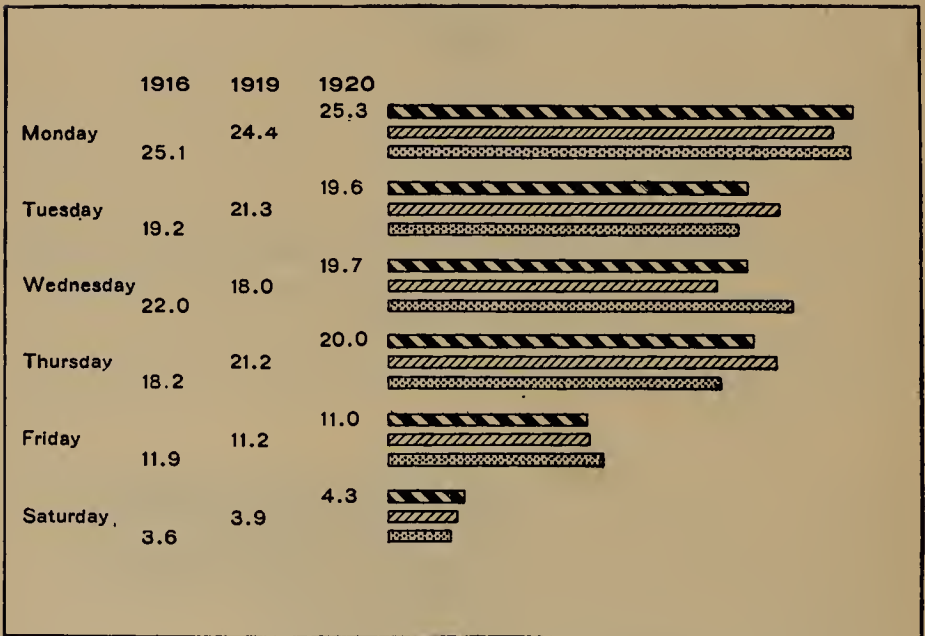
Figure 34. (a) Chart Showing Percentage of Cattle Received Each Day of Week at Chicago.



Courtesy Commercial Research Department, Swift and Company

Figure 34. (b) Chart Showing Percentage of Hogs Received Each Day of Week at Chicago

in Chicago, it is found that instead of having on Monday almost 50 per cent of the entire week's arrivals of cattle, the percentage arriving on the two big market days was reduced one-half, while the quotas for Tuesday and Thursday were increased until the first four days of the week were almost equal. These figures show how the zone system made the market an all-week affair. With hogs the improved distribution was little less remarkable.



Courtesy Commercial Research Department, Swift and Company

Figure 34. (c) Chart Showing Percentage of Sheep Received Each Day of Week at Chicago"

The following table indicates the percentages of the week's total supply of cattle arriving each day for the first five days of the week in Chicago in the month of February, 1917 and 1918:

	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
1917.....	45.3	16.8	20.9	11.9	3.9
1918.....	22.6	22.3	12.6	22.0	14.1

It is seen that receipts on the first five days under the new plan were nearly uniform, while in 1917 more than 45 per cent of the week's cattle supply came on Monday. Friday's receipts also show a big increase. As to hogs, note these weekly receipt percentages for February, 1917 and 1918:

	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
1917.....	27.7	12.2	19.7	17.7	14.2
1918.....	21.3	18.0	12.8	18.9	17.8

Tendency Toward More Even Receipts

The evenness of the receipts in 1918 as compared with 1917 is apparent. Friday with 17.8 per cent and Saturday with 19.3 per cent of the week's receipts in 1918 also carried their share. Here is a comparison of total cars of all stock arriving at Chicago in February, 1917 and 1918:

	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
1917.....	28.4	14.5	25.2	16.1	9.8
1918.....	23.6	20.3	12.8	19.6	15.3

This table shows that under the old plan 53.6 per cent of the week's total supply arrived on the two big market days, whereas in 1918 the number arriving on those days was greatly reduced, while Tuesday and Thursday were largely increased as market days. Even Friday, which was almost an orphan day, had its supply materially enlarged, resulting in the long-desired 5-day market.

Sheep are not considered here because sheep headed marketward, with the exception of stock from nearby farming or feeding areas, are usually stopped at feeding stations easily accessible to the market. From these reservoirs supplies can be fed into the market hopper as rapidly as conditions of supply and demand appear to warrant or permit.

Was Zone Plan a Success?

Has the zone plan been successful in bringing about more nearly equally distributed receipts throughout the two years

of its existence, or has it fallen down in its purpose? Stockyard statistics prove its efficacy, but to show that the figures given for February held good throughout 1919, compare cattle figures for the April and May periods of 1919 and 1917:

	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
1917.....	39.9	7.7	37.7	9.9	3.6
1919.....	33.8	26.6	13.8	19.7	4.9

Under the old 2-day market arrangement during the 1917 period, it was truly a feast and famine affair, nearly 80 per cent of the week's receipts of cattle coming to market Mondays and Wednesdays, and only about 17 per cent Tuesdays and Thursdays. The zone plan boosted Tuesday and Thursday and decreased the two big days. It meant that the shipper was getting better service. For hogs the figures for the April and May period of 1919 and 1917 were as follows:

	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
1917.....	31.9	11.0	22.0	16.2	12.2
1919.....	26.5	18.5	12.2	22.5	16.6

It is the same story of excellent results. Because of heavy receipts of cattle from the western range country, Montana, Nebraska, and the Dakotas, which comes in the third zone and is not affected directly by the zone loading plan, cattle figures are taken for the October and November period of 1919 and 1917. The percentages arriving on the first five days of the week during those periods follow:

	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
1917.....	36.4	14.1	25.5	13.1	7.3
1919.....	33.0	20.9	17.2	17.2	8.1

It might be thought that the heavy liquidation of range cattle, which occurs during October and November, would tend to lessen the efficacy of the zoning system as a supply equalizer, but a study of the actual figures shows that the first four days carried a much more nearly even load in 1919 than they did in 1917.

Less Congestion and Shrink

This improved distribution method means that there is less congestion at the stockyards than formerly, and consequently less shrink on livestock received. It means, further, that commission men can give stock more careful attention and better handling than under the old plan. Commission men had for years realized that the old 2-day market worked to the detriment of the farmer, and they had made earnest efforts to rectify conditions. With the even distribution that may now be had under the zone plan, shippers can request that stock be held over for a day or two, if desired, to fill and wait for favorable market conditions. Stockyard labor is more evenly divided from day to day, resulting in more prompt unloading and yarding and better feeding and weighing of the stock. Packing companies are being supplied with a more even flow of stock from day to day, and can maintain more uniform hours of labor among killing gangs. Furthermore, the zone plan has made possible the establishment of regularly scheduled livestock trains, vastly more satisfactory than the old pick-up trains that stopped frequently to load or to unload dead freight.

There have been at times wide and severe price fluctuations since the new plan was put in operation, but these have occurred in spite of, rather than because of, the zone loading plan. Without this system the fluctuation would have been worse. Some complaints came to Chicago from patrons in the first zone because they were not being permitted to ship whenever they desired, but unusual conditions of supply distribution, as, for instance, generous supplies of hogs in Illinois and other first zone territory and a relatively light crop ready for market in the second zone also entered into the situation as factors for a short period during the closing months of 1919. It is the sentiment among interested men at the stockyards, who are experts on the mechanism of markets, that shippers and producers, in making an effort to overthrow the zoning arrangement, are simply taking off the regulator on a great industry.

Plan Tried Amid Stress of War

War times always tend to disturb industrial conditions and produce a nervous undertone in markets, and the recent World War was no exception. Livestock prices rose to unprecedentedly high altitudes. High markets are always more or less erratic, and the period that has elapsed since November 11, 1918, has been fraught with readjustment difficulties, many if not most of which could not have been avoided even under ideally perfect distribution of livestock receipts.

"Car shortage and other unfavorable railroading conditions have played havoc with the zoning system," said M. J. Gormerly, who was a member of the zoning committee at Chicago, and assistant northwestern regional director, "but there is no reason to change the zoning system. It is not to blame. It is working out to the best interests of all concerned."

Boundaries of Chicago Zones

When the United States government stepped in to safeguard every pound of food products as a war measure, the only plan of producing more nearly equal distribution of livestock shipments that suggested itself was the establishment of zones about the markets. There were designated certain market days for each zone or section. For example, the territory in Zone 1 about the Chicago market comprised approximately the southern two-thirds of Wisconsin, that portion of Iowa east of a line running through Manchester, Cedar Rapids, Iowa City, and Keokuk, and all of Illinois except a small portion in the extreme southern part, the Illinois and Indiana line forming the eastern boundary. Shipments from this zone were to be accepted for movement to arrive at Chicago for Tuesday, Thursday, Friday, and Saturday markets.

The Chicago Zone 2 included that territory beyond the designated boundary of the first zone and up to and including stations within the 36-hour scheduled limit on the interested railroads. The more important points in the outer boundary

were South St. Paul, Minnesota; Sioux Falls, South Dakota; Lincoln, Nebraska, and Missouri River markets. This zone comprised the southeast corner and a narrow strip of southern Minnesota, the most of Iowa, the northern half of Missouri, and the extreme southern portion of Illinois. Livestock from this zone were to be accepted for arrival at Chicago on Mondays, Wednesdays, Fridays, and Saturdays. ' No restrictions were in force on the movement of livestock to Chicago from the territory outside of Zones 1 and 2.

Stockyard interests at several of the smaller markets have watched closely the results of the zoning arrangement, and either devised similar plans or were preparing to do so, and profited from the experience of the larger markets. The zone loading plan was in operation during a period of abnormal conditions, a period replete with many unusual transportation difficulties. In spite of these opposing forces, results have been accomplished in the equalization of market receipts that were greatly to be desired.

Some Negative Results of Zone Plan

A study of the zone system in practice requires the statement of the negative side of the working of the plan as well as the positive. In some important respects the system did not work satisfactorily. It has been shown by one critic that the zone system was tried at the Chicago and Kansas City markets and that it was discarded at the latter point, having failed either to regulate receipts, or stabilize prices. Chicago was then the only market under restriction, and shippers not only in nearby, but also in competitive territory, protested against the continuance of its operation.

The zone system was advertised as a price stabilizer. In that respect it has been in many cases a signal failure, as the course of price events has been even more erratic during the past two years than previously. It is stated that its proponents claim that this condition occurred despite zone loading,

but having failed as a price-stabilizing influence, its opponents ask wherein it has accomplished anything benefiting shippers or producers.

Instead of equalizing receipts at Chicago, opponents of the plan hold the system had the effect of dumping the bulk of the cattle supply at the Monday and Tuesday sessions. Formerly Monday and Wednesday were the heavy sessions, Tuesday's light run affording an opportunity to clean up any excess arriving on Monday. Under the new conditions Illinois shippers were forced to load for Tuesday, and since shippers commonly fill up on Monday they experienced a succession of bad markets. Wednesday was as bare as Tuesday was prior to establishing the zone system. No manipulation of the movement can alter the fact that heavy receipts on two days are to the disadvantage of the selling side of the trade, and after 35,000 to 38,000 cattle have been dumped into the market hopper the first two days, the rest of the week is required for cleaning up on a peddling basis.

Shippers' Complaints on Car Movement

Shippers in the first zone, which comprises the major part of Illinois and eastern Iowa, took the position that they cannot go to any other market than Chicago, and that under the zone system they were practically restricted to two days, Tuesday and Thursday. Besides, due to the car situation, they were frequently unable to load for these sessions. For instance, at Rock Falls, Illinois, cars were set Saturday for a 5-car drove of cattle, the owner of which was anxious to load immediately, as the cattle could have been in Chicago Sunday for Monday's market. The agent had no latitude, however, and the cars were held until Monday, when, by immediate loading, they could have been back in the country by that time, and in the case of this consignment a bad market Tuesday cost the owner \$400. While clamor for cars was heard everywhere, this rolling stock was held on a side track from Saturday until

Monday, to permit the working of the zone system. Presumably this was not an isolated case. Shippers in the first zone contended that the system would be less disadvantageous to them if they could get to market on the specified days, but not infrequently cars were not available, and when they were sent the zone system prohibited loading.

From the second zone, which mainly concerns Iowa, came complaints that shippers were forced to go to other markets than Chicago. This was not objectionable, when the stock was adapted to the needs of those markets. But compelling a feeder to ship fat steers, for instance, to stockyards where they are not wanted meant a severe penalization. At an Iowa point on one occasion cars were placed for a drove of cattle that could not be loaded for Chicago on that day. The owner, insisting on going to Chicago, was forced to waive his right, and went to the bottom of the waiting list. His alternative was to consign to Sioux City, where such cattle were not wanted. A month later his turn on the waiting list came around, enabling him to get to Chicago, but meanwhile the market had dropped more than \$1 per hundredweight. During some 60 days at another time thousands of hogs were diverted westward, forced out of regular channels, to sell at a decided disadvantage, due to the operation of the zone system.

Need Zone Plan in All Markets

Summing up the situation regarding the zoning plan, it must be said that what the restricted loading method would accomplish under normal transportation conditions must at present be left to conjecture. As the plan worked out it must be admitted that in certain cases it failed to stabilize prices or equalize receipts. For a fair trial it must be applied to all markets under normal conditions, but although the matter is one for livestock producers themselves, shippers resent the fact that they are under restrictions, and they feel that the dictating to a man where he is to market his products is a vicious

principle. This is the fundamental feeling that must be changed if any progress is to be made in the interests of the whole livestock industry.

Hog Price Control Plan

Coming to the second plan for effecting changes in the livestock marketing system, namely, hog price control, it is necessary to take up, first the factors which make at all possible such price determination. As with other agricultural products three forces are concerned with making the price. These are cost of production, supply and demand, and strategic considerations. But while the prices of corn and hogs are "determined chiefly by supply and demand, together with the occasional influence of strategic manipulation," it would seem clear that in the long run cost of production on the average is practically identical with both the supply-and-demand price and the actual price. It has been a fixed idea with hog producers for 50 years without the use of careful statistics, that money could be made if hogs could be sold for a value per 100 pounds of more than the value of 10 bushels of corn. In others words, a ratio of 10 bushels of corn to 100 pounds of hog was accepted as determining a fair price.

It is true that this ratio represents cost of production, for it indicates what return is needed to induce farmers to continue raising hogs, but while this ratio represents an average, which in the long run is the same as the actual price and the supply-and-demand price, at any one given time the cost of production price is likely to be either higher or lower than the other prices. Still, a 10-year average of actual hog prices would seem to be approximately equal to a 10-year average of the cost of production price of hogs.

Ratio Method of Determining Hog Prices

During the war this problem of fluctuating prices for livestock was studied by statisticians of the Commission to Inves-

tigate the Cost of Producing Hogs, appointed by the United States Food Administration. This commission reported on October 27, 1917, recommending that the price for hogs be made equivalent to the value of a certain number of bushels of No. 2 corn. In doing so the commission adopted the ratio method of price determination worked out and urged by *Wallace's Farmer*.³

Taking the ten years 1907-1916 inclusive, the commission found that the ratio for that period was 11.67, since that number of bushels of Chicago No. 2 corn was equal in value to 100 pounds of Chicago hogs. It was calculated that the average ratio necessary to bring production of hogs back to normal was 13.31, and in order to increase production 15 per cent above normal, a minimum of 14.31 was required. For it was felt that an increase was important in face of the war conditions. Therefore, on November 3, 1917, a bulletin of the Food Administration announced that it would set up a ratio of 13 to 1 on hogs farrowed in the spring of 1918, or, in other words, it would pay hog producers per 100 pounds of hog what was equal to 13 bushels of corn. Since the need was great, it was expected that this ratio, which was 13 per cent more than the old ratio, would increase hog production.

In carrying out the program, however, in the autumn and winter of 1918-1919, the general opinion seems to be that the Food Administration failed to live up to its guarantee. For example, in September, 1918, the Administration stated that the 13-bushel ratio was based upon a ratio between farm corn prices and Chicago hog prices, although the original plan contemplated a ratio based upon Chicago corn prices and Chicago hog prices. It was also claimed that export prices of pork did not justify the guarantee. As a matter of fact, in April, as an instance, when the historical ratio was 12.7, the cost of producing hogs for the Chicago market was \$23.18,

³ This whole subject of hog prices is set forth by the editor of *Wallace's Farmer*, Henry A. Wallace, whose plan was thus adopted by the United States government, in his recent book entitled "Agricultural Prices."

while the actual price was \$17.45, or a loss of \$5.73 per 100 pounds. Naturally there was dissatisfaction among hog producers and conferences were held between the producers and the Food Administration. The Administration then gave up trying to keep to the impossible 13-bushel ratio, and supported a \$17.50 minimum, or an actual ratio of 10.8 bushels.⁴

Co-operation Urged for Hog Price Control

It was at this point that steps were taken to rescue the plan of hog price control, or price stabilization, and make it work, even if by making it more workable it would be less pleasing to the farmers.⁵ It was realized that the only way to succeed was to win the co-operation of all parties. Everett C. Brown, president of the Chicago Live Stock Exchange, urged that the only way to make the plan work was to pledge the packers to support it. His foresight and his efforts in directing the price stabilization contributed largely to the success it had during its brief life.

A conference between the Live Stock Sub-Committee of the Agricultural Advisory Board, including special members representing the hog industry and the Food Administration, held from October 23 to 25, 1918, after considering the present situation of the pork and hog market, concluded that:⁶

The entire marketing situation has so changed since the September joint conference as to necessitate an entire alteration in the plans of price stabilization.

The current peace talk has alarmed the holders of corn and there has been a price decline of from 25 cents to 40 cents per bushel.

The fact that the accumulations of low-priced corn in the Argentine and South Africa would, upon the advent of peace and liberated shipping, become available to the European market, has created a great deal of apprehension on the part of corn holders.

⁴ See Wallace, Henry A., *Agricultural Prices*, pp. 30-35.

⁵ See Hibbard, B. H., *Marketing Agricultural Products*, pp. 169, 170.

⁶ For an interesting discussion of this final arrangement for hog price stabilization, see *The National Live Stock Exchange Bulletin*, November, 1918.

This decline has spread fear among swine growers that a similar reduction in the prices of hogs would naturally follow. Moreover, the lower range of corn prices would, if incorporated in a 13 to 1 ratio, obviously result in a continuously falling price for live hogs.

In view of these changed conditions many hog producers, anticipating lower prices, rushed their hogs to market in large numbers, and this overshipment added to and aggravated the decline. The information of the Department of Agriculture indicated that the supply of hogs had increased about 8 per cent, while the highest unofficial estimate did not exceed 15 per cent increase of production over that of 1917. On the other hand, the arrival of hogs in the seven great markets during the three weeks preceding the conference was 27 per cent more than during the corresponding period of 1917, demonstrating the unusually heavy marketing of the available supply. In the face of the excessive receipts some packers had not maintained the price agreed upon in the preceding month. On the other hand, many of the packers paid over the price offered to them in an endeavor to maintain the agreed price. The result in any event was a failure to maintain the October price basis determined upon by the September conference and undertaken by the packers.

Effect of Price Break in October

Another factor contributing to the break in prices during the month of October was the influenza epidemic. It sharply curtailed consumption of pork products and temporarily decreased the labor staff of the packers about 25 per cent.

The exports of 130,000,000 pounds of pork products for October compared with about 52,000,000 pounds in October, 1917, and the export orders placeable by the Food Administration for November amounted to 170,000,000 pounds as contrasted with the lesser exports of 98,000,000 pounds for November, 1917. The increased demands of the Allies were

continuing and were in themselves proof of the necessity for the large production for which the Food Administration asked. The increase in export demands appeared to be amply sufficient to take up the increase in hog production, but unfavorable market conditions existing in October afforded no fair index of the aggregate supply and demand. It was evident that the enormous shortage in fats in the central empires and neutral countries would immediately, upon peace, result in additional demands for pork products. These demands on top of the heavy shipments to the Allies would tend materially to increase the American exports, since there was no considerable reservoir of supplies outside of the United States. It seemed probable that the prospective supplies would be inadequate to meet the world demand. With the return to peace, so far as it was possible to interpret this fact at that time, it appeared that there should be even a stronger demand for pork products after the war, and, therefore, any alarm of hog producers as to the effect of peace appeared to be unwarranted by the outlook.

The conference therefore concluded that attempts to hold the price of hogs to the price of corn might work out to the disadvantage of pork producers, and that any interpretation of the formula should be a broad-gauged policy applied over a long period. The conference felt further that in substitution of the previous plans of stabilization, the Live Stock Subcommittee of the Agricultural Advisory Board together with the specially invited hog producers' representatives should accept the invitation of the Food Administration to join with the Administration and the packers in determining the prices at which controlled export orders were to be placed. This was to be done regularly.

Packers Ready to Co-operate

The influence of these orders was to be directed to the maintenance of the common object, namely, the stabilization of the price of live hogs so as to secure as far as possible fair

returns to the producer, and the insurance of an adequate future supply. These foreign orders were placed upon the basis of cost of hogs to the packers. As the result of long negotiations between this body and the packers' committee, representing the 45 to 50 packers participating in foreign orders, together with the allied buyers, all under the chairmanship of the Food Administration, the following undertaking was given by the packers:

In view of the undertakings on the part of the Food Administration with regard to the co-ordinated purchases of pork products covered in the attached, it is agreed that the packers participating in these orders will undertake not to purchase hogs for less than the following agreed minimums for the month of November, that is, a daily minimum of \$17.50 per hundred pounds on average of packers' droves, excluding throw-outs; throw-outs to be defined as pigs under 130 lbs., stags, boars, thin sows and skips; further, that no hogs of any kind shall be bought except throw-outs, at less than \$16.50 per hundred pounds, the average of packers' droves to be construed as the average of the total sales in the market of all hogs for a given day, all the above to be based on Chicago.

We agree that a committee shall be appointed by the Food Administration to check the daily operations in the various markets, with a view to supervision and demonstration of the carrying out of the above. The ability of the packers to carry out this arrangement will depend on there being a normal marketing of hogs based upon the proportionate increase over the receipts of last year. The increase in production appears to be a maximum of about 15%, and we can handle such an increase. If the producers of hogs should, as they have in the past few weeks, prematurely market hogs at such increasing numbers over the above, it is entirely beyond the ability of the packers to maintain these minimums and therefore we must have the co-operation of the producer himself to maintain these results.

It is a physical impossibility for the capacity of the packing-houses to handle a similar overflow of hogs and to find a market for the output. The packers are anxious to co-operate with the producers in maintaining a stabilization of price and to see that producers receive a fair price for the products.

(Signed) Thos. E. Wilson,
Chairman Packers' Committee.

The plan embodied above was adopted by the conference.⁷ The Food Administration appointed a committee, comprising Mr. Thomas E. Wilson, Chairman of the Packers' Committee, Mr. Everett Brown, President of The Chicago Live Stock Exchange, Major E. L. Roy of the Food Administration, and Mr. Louis D. Hall of the United States Bureau of Markets, to undertake the supervision of the execution of the plan. In the various markets commission men were asked to co-operate in carrying out the plan embodied in the packers' agreement. It was evident that offers by commission men to sell hogs below the minimum established above were not fair, either to the producer, or the participating packers. So, Mr. Brown undertook on behalf of the commission men in the United States that they would loyally support the plan.

It was, therefore, believed by the conference that this new plan, based as it was upon a positive minimum basis, would bring better results to the producer than average prices for the month. It did not limit the top prices, and would narrow the margins necessary to country buyers in a more variable market. It was believed that the plan would work out close to an \$18 average. Hog producers of the country, it was stated, would contribute to their own interest by not flooding the market, for it was clear that if an excessive overpercentage of hogs were marketed in any one month, price stabilization and control could not succeed. It was also certain that producers themselves could contribute materially to the efforts of the conferences if they would do their marketing in as normal a way as possible. The whole situation as existing at that time demanded a frank and explicit assurance from the confer-

⁷ The members of the conference were: Food Administration—Herbert Hoover, F. S. Snyder, Major E. L. Roy, G. H. Powell. Department of Agriculture—Louis D. Hall, F. R. Marshall. Producers—H. C. Stuart, Elk Garden, Virginia, Chairman Agricultural Advisory Board; W. M. McFadden, Chicago; A. Sykes, Ida Grove, Iowa; John M. Evvard, Ames, Iowa; J. H. Mercer, Topeka, Kansas; J. G. Brown, Monon, Indiana; E. C. Brown, President, Chicago Live Stock Exchange; N. H. Gentry, Sedalia, Missouri; John Grattan, Bloomfield, Colorado; Eugene Funk, Bloomington, Illinois; Isaac Lincoln, Aberdeen, South Dakota; C. W. Hunt, Logan, Iowa; C. E. Yancy; W. R. Dobson. Packers—Thomas E. Wilson, F. W. Waddell, G. F. Swift, Jr., Robert Mair, Arthur Meeker, J. A. Hawkinson, G. C. Shepard, E. S. Waterbury, L. F. Freeman, F. T. Fuller, T. W. Taliaferro, S. T. Nash, and others.

ees represented, namely, that every possible effort was to be made to maintain a live hog price commensurate with hog production costs and reasonable selling values, in execution of the declared policy of the Food Administration to use every agency in its control to secure justice to the farmer.

Packer and Producer Co-operation Plan

The stabilization methods adopted for November represented the best efforts of the conference, concurred in by the Food Administration and the Live Stock Sub-Committee of the Agricultural Advisory Board, together with special hog producer members and the representatives of the packers. To improve the unsatisfactory situation, which had unfortunately resulted because of the injection of uncontrollable factors, the conference asked the producer to co-operate in the difficult task.

It was at a meeting held at the Saddle and Sirloin Club, Chicago, Illinois, October 30, 1918, between the Price Stabilization and Control Committee and representatives of the markets at Cincinnati, East Buffalo, Indianapolis, Kansas City, Omaha, Pittsburgh, Sioux City, St. Louis, and St. Paul, that the following plan⁸ for price stabilization was announced:

TO THE PACKERS, COMMISSION MEN AND ORDER BUYERS IN ALL MARKETS:

The undersigned committee appointed by the United States Food Administration on stabilization and control of hog prices affecting the agreement made in Washington last week, wish to announce the following:

There has been appointed in each market a sub-committee to work out the plan of the Food Administration, which shall consist of one representative of the packers, one representative of the commission men, a representative of the Bureau of Markets, and where the Bureau of Markets is not represented, the first two mentioned shall select a third member. This committee shall be in control of price stabilization, and this shall be understood as affecting all purchases and sales of hogs.

It shall be understood that all parties covered by this agreement will undertake not to buy or sell hogs for less than the following agreed minimums for the month of November, that is, a daily minimum of \$17.50 per hundred pounds on average of packers' droves, excluding throw-outs;

⁸ The National Livestock Exchange Bulletin, November, 1918.

throw-outs to be defined as pigs under 130 pounds, stags, boars, thin sows and skips; further, that no hogs of any kind except throw-outs, shall be bought or sold at less than \$16.50 per hundred pounds; the average of packers' drives to be construed as the average of the total sales in the market of all hogs except throw-outs for a given day. All the above to be based on Chicago.

Provisions have been made by the appointment of sub-committees at the following markets: Chicago, Cincinnati, Cleveland, Detroit, East Buffalo, Indianapolis, Kansas City, Milwaukee, Omaha, Pittsburgh, Sioux City, Sioux Falls, St. Joseph, South St. Paul, St. Louis, and Wichita, and should the necessity arise sub-committees will be appointed at other markets not mentioned.

It is the duty of the sub-committee on each Saturday to furnish to Chairman E. C. Brown, weekly reports which will show the daily average cost price and total number of hogs bought each day in each market for that week so that the same may reach the Control Committee each Monday morning.

The following is a list of the differentials to be used at the markets mentioned below:

Chicago will serve as the basis; Cleveland plus 25 cents; Indianapolis plus 20 cents; Pittsburgh plus 30 cents; Detroit plus 25 cents; Buffalo plus 30 cents; Cincinnati plus 25 cents; Toledo plus 25 cents; St. Louis minus 10 cents; St. Joseph minus 50 cents; St. Paul minus 50 cents; Omaha minus 50 cents; Sioux City minus 50 cents; Sioux Falls minus 50 cents; Wichita minus 50 cents; Kansas City minus 40 cents; Milwaukee—Chicago basis.

Any violations of this understanding should be immediately reported to Everett C. Brown, Chairman of the Price Stabilization and Control Committee in Chicago, who will in turn report them to the United States Food Administration for proper action.

THOMAS E. WILSON,
For the Packers.

LOUIS D. HALL,
For the Bureau of Markets.

MAJOR E. L. ROY,
For the Food Administration.

E. C. BROWN, Chairman,
For the Live Stock Exchanges.

In December, minimum prices were fixed in accordance with the following announcement, which shows the way in which the plan was to function.

Hog Price Stabilization in Effect

Under date of November 15, 1918, the United States Food Administration issued the following statement:

The Food Administration announces that after consultation with the sub-committee of the Agricultural Advisory Board and special swine producers' representatives and with the packers, it has been arranged that the November price basis for hogs shall continue through December.

It is highly desirable that the lighter weight hogs be held back for the next 30 days. If withheld at this time the possibility of breaking down present price levels because of excessive receipts of the lighter hogs will be avoided.

All available hog products that can be spared will be required for foreign shipment in December and January and thereafter.

Yours truly,

UNITED STATES FOOD ADMINISTRATION,
F. S. Snyder (Signed).⁹

The plan of hog price stabilization came to an end officially on March 6, 1919. On that date the Food Administration announced that as all restrictions on exports of pork and pork products had been lifted by the War Trade Board, there would be no further fixing of hog prices. The war was over and wartime restrictions were no longer to be tolerated, even when efficiently and intelligently carried out. As has been pointed out, should the ratio price-making method here outlined be put into practice in normal peace times, it is probable that it will be as a criterion for bargaining rather than as a rule adopted in advance for the actual determination of a price on an adopted ratio.¹⁰ However, it must be realized that the price stabilization plan as an experiment in tackling the problems of marketing livestock is, and will continue to be, of vital importance.

⁹ The National Livestock Exchange Bulletin, November, 1918.

¹⁰ Hibbard, B. H., Marketing Agricultural Products, p. 170.

CHAPTER XXX

THE CO-OPERATIVE LIVESTOCK MARKETING MOVEMENT

Growth of Co-operative Ideas

Whatever success the two plans of zoning and price control achieved in bettering the livestock marketing system was due to the new element of co-operation between the different interests concerned. For a period of several years before the experiments described in the previous chapter were put into practice, this spirit of co-operation as a means of solving the problems of marketing agricultural products had been growing. While the idea of co-operation in agriculture is not new, it has only taken practical form recently in the matter of livestock marketing. It was in 1913, for example, that there was held in Chicago the first National Conference on Marketing and Farm Credits, at which "the delegates were really laying a new trail in the economic woods of modern industry" by bringing about a readjustment of the farming population to harmonious relations with the industrial world.¹ The second conference dealt with co-operation, which was its keynote. The third conference in 1915 sounded again this new note in agricultural economics in America, voicing the demand for co-operation among farmers in the sale of their produce. There had been notable progress in these three years from the individualistic to the social concept.

Practical co-operative solution of the problems of marketing livestock was considered at a special conference held just

¹ Marketing and Farm Credits, a collection of papers read at the third annual session of the National Conference on Marketing and Farm Credits in joint program with the National Council of Farmers' Cooperative Associations, Chicago, November 29 to December 2, 1915, p. 12.

a few days before the last one referred to, and was of importance because it was held by the direction of the Secretary of Agriculture, Hon. David F. Houston. The meetings were conducted by the United States Office of Markets and Rural Organization, as has been stated in previous reference to it, and there were present representatives of all the principal organizations and prominent individuals identified with the production, marketing, and distribution of livestock and meat products in the United States. Stockmen, railroad officials, packers, government officials, and others, testified to the importance of the marketing of livestock, totaling some \$2,000,000,000 annually. The principal topics considered were: growing and feeding livestock, financing livestock operations, country dealers and shippers, co-operative livestock shipping associations, transportation, feeding stations, terminal railroads, stockyards, market papers, reports and prices, commission men and exchanges, stockyard traders, packing and wholesale distribution of meats and by-products, and the retail meat trade.

Remedies to Aid Marketing

At this conference definite remedies for unsatisfactory conditions in the industry were suggested by Mr. T. W. Tomlinson, Secretary of the American National Live Stock Association, Denver, Colorado, as follows:

1. A more even distribution of receipts on five days of the week. This would prevent delays at terminals and enable the business to be transacted at less expense.
2. A weekly publication by the government of data as to the meat supply on hand.
3. The establishment of public abattoirs in connection with public stockyards.
4. Slaughterers to relinquish as far as possible their interest in and control of stockyards and other instrumentalities involved in the marketing of livestock.
5. Commission houses not to serve as both seller and buyer

of the same stock, and to sell direct to country purchasers.

6. Federal and state supervision of the methods and practices at the central markets.
7. A greater co-operation toward the end of securing unrestricted competition.

Of these suggestions it is interesting to note at this point in passing that the first remedy was put into effect in the zoning plan; the second, as to market data, is now supplied by the United States Bureau of Agricultural Economics; the fourth, as to separation of packer ownership and stockyard control, was legalized by the so-called "Consent Decree" between the packers and the Attorney-General and in the Packers and Stockyards Act, 1921; the fifth remedy, as to commission men, is in effect at several markets; the sixth, regarding federal supervision of markets, is now in effect, and the last is being attempted. At the National Agricultural Conference, January 23-27, 1922, recommendations were adopted urging greatly enlarged provision on the part of federal and state governments for the gathering and utilization of data relating to number and classification of animals, market statistics, etc.

County Agents and Farm Bureaus

These conferences were symptoms of a broad movement of co-operation in agriculture that has been going on for some 15 years. Beginning with the work of the county demonstrators in the South and the county agents in the northern states, of whom A. B. Ross of Bedford County, Pennsylvania, H. H. Parke of DeKalb County, Illinois, and John H. Barron of Broome County, New York, were among the pioneers, the benefits of co-operation were seen. These county agents were employed jointly by the federal and state governments and the counties. The county agent was an adviser in all matters pertaining to farming. Working with and supporting the county agents were what were called "county farm bureaus," often started by chambers of commerce, but embracing the member-

ship of the most progressive farmers in the county who dominated the bureaus naturally because the bureaus existed for the solution of an agricultural problem.²

The idea of co-operation of all the interests connected with agriculture within a county spread rapidly after Ross began his work in 1911. Agricultural leaders felt that they were in a great movement and it had an important future, but the growth of the idea was vastly stimulated by the emergency of the World War. In increasing the production of food to win the war the federal government was able to make use of and to further the work of the organization of farm bureaus. The number of the bureaus increased by leaps and bounds in many states, and therefore the natural and logical development into state associations or state farm bureaus took place, the first ones being formed in 1917. These state federations had prestige to command respect and were the necessary step in the growth from local co-operation to organization on a national scale.³ At this same time it must be remembered that this was not the only farmer co-operative movement on foot, for in accord with the spirit of the times, the Non-Partisan League was growing in the Northwest, the Equity in Wisconsin was successful, and there were others more local in character. However, as has been pointed out by Professor Hibbard, these organizations did not possess the same advantage of being a natural nucleus within each state, with a sort of official status for the development of a national federation.

American Farm Bureau Federation

The national phase of the farm bureau movement began also in New York State, as had the county bureaus, and in 1919 at Ithaca a meeting of state federations was held to consider the advisability of forming a national organization. The result of the leadership of the states with strong federa-

² For an excellent description of the development of the farm bureau movement, see Kile, Orville Merton, *The Farm Bureau Movement*, Chaps. VI-IX.

³ Hibbard, B. H., *Marketing Agricultural Products*, p. 262.

tions was that at a meeting in Chicago in November, 1919, there was organized the American Farm Bureau Federation, whose permanent organization was effected in 1920.

This was an organization whose program was on a business basis, in line with a statement of Henry C. Wallace, editor of *Wallace's Farmer*, who later became Secretary of Agriculture. He said:

This federation must get to work at once on a business program if it is to justify its existence. That doesn't mean turning the work over to committees, either. Every line must be in charge of experts. The best qualified men in the United States should be hired to manage each of the various lines of work. This federation must not degenerate into an educational or social institution. It must be made the most powerful business organization in the country.⁴

Business Program of the Federation

The business program of the Federation was outlined in the economic section as follows:

1. To extend co-operative marketing of farm crops to that point in the distribution system where the maximum benefits are secured for the producer, and incidentally, for the consumer.
2. To limit the profits and reduce the costs of distribution in all lines not handled co-operatively.
3. So to estimate the effective world supply of any farm product, and so to regulate the flow to market as to eliminate sharp and extreme fluctuations.
4. To establish new markets for surplus American farm products.
5. To provide cheaper sources of fertilizer and more economical means of production.

Declaring that farmers were entitled to cost of production plus a reasonable profit, plans were worked out after months of investigation for marketing various agricultural products, and among them the marketing of livestock. Regarding livestock problems, at a conference of representatives of various farm and livestock organizations called by the American Farm

⁴Quoted in Kile, O. M., *The Farm Bureau Movement*.

Bureau Federation on July 23, 1920, the president of the federation was requested to call a livestock conference at an early date. Such a conference was called and held October 8, 1920, and at it the president of the Farm Bureau Federation was authorized to appoint a committee to give special consideration to livestock marketing problems and report to the associations they represented and to a conference called by the federation's president.

Farmers' Livestock Marketing Committee Report

In accordance with this authorization, President J. R. Howard appointed the Farmers' Livestock Marketing Committee of Fifteen on January 3, 1921. Its personnel was national in character, and was made up of several of the more prominent students of the problem.⁵ After study and investigation covering many months, the committee reported to President Howard that it was ready to make its report, and asked that a National Livestock Conference be called. This was done and on November 11, 1921, this conference after two days' consideration unanimously adopted the report of the committee.⁶

The plan submitted by the committee and adopted by the

⁵ The committee was as follows: C. H. Gustafson, Chairman, Chicago; A. Sykes, Vice-Chairman, Ida Grove, Iowa; H. W. Mumford, Secretary-Treasurer, Chicago; Harry G. Beale, Mt. Sterling, Ohio; J. E. Boog-Scott, Coleman, Texas; W. J. Carmichael, Chicago; W. A. Cochel, Kansas City, Missouri; C. E. Collins, Kit Carson, Colorado; E. H. Cunningham, Des Moines, Iowa; Howard M. Gore, Clarksburg, West Virginia; J. B. Kendrick, Sheridan, Wyoming; W. A. McKerrow, St. Paul, Minnesota; J. H. Skinner, La Fayette, Indiana; O. O. Wolf, Ottawa, Kansas. Alternates: John G. Brown, Monon, Indiana; James Clemmens, Kansasville, Wisconsin; W. S. Corsa, White Hall, Illinois; John M. Evvard, Ames, Iowa; E. C. Lasater, Falfurrias, Texas; William H. Pew, Ravenna, Ohio. Ex-officio: J. R. Howard, Chicago. Advisory: C. V. Whalin, United States Bureau of Markets and Crop Estimates.

⁶ At this conference there were representatives of the following organizations: American National Live Stock Association, Arizona Farm Bureau Federation, California Farm Bureau Federation, Central Co-operative Commission Association, Corn Belt Meat Producers' Association, Farmers' Educational and Co-operative State Union of Nebraska, Idaho Wool Growers' Association, Illinois Agricultural Association, Indiana Federation of Cattle Feeders, Indiana Federation of Farmers' Associations, Iowa Farm Bureau Federation, Iowa Federation of Co-operative Live Stock Shippers, Iowa Fleece Wool Growers' Association, Kansas State Farm Bureau, Kentucky Farm Bureau Federation, Michigan Live Stock Exchange, Michigan State Farm Bureau, Minnesota Central Co-operative Live Stock Shippers' Association, Minnesota Farm Bureau Federation, Missouri Farm Bureau Federation, Missouri Federation of Live Stock Shipping Associations, National Wool Growers' Association, National Swine Growers' Association, Nebraska Farm Bureau Federation, North Dakota Farm Bureau Federation, North Dakota Live Stock Breeders' Association, Ohio Farm Bureau Federation, Ohio Live Stock Shippers' Association, Ohio Sheep and Wool Growers' Association, Wisconsin Farm Bureau Federation, Wyoming Stock Growers' Association, Wyoming Wool Growers' Association.

conference was frankly built upon the co-operative marketing principle. In brief the committee recommended that :

To provide the required agencies for the effective handling of the live stock marketing problems and otherwise promote the best interests of live stock producers it is necessary for the producers themselves to have:

First: Producers' live stock commission associations established at the terminal markets to render service to individual producers and co-operative live stock shipping associations.

Second: Producers' stocker and feeder companies established in connection with terminal commission associations.

Third: A national organization of live stock producers to correlate and direct the whole movement and carry on a broad campaign of marketing education.

Fourth: Co-operative live stock shipping associations established at shipping points where available business will justify and local sentiment approves.

These concrete recommendations were based upon certain conclusions which are so clearly stated in the preamble of the report that it is quoted as follows :

The Committee early found that the problems in connection with live stock marketing which the Committee would be obliged to consider involved co-operative marketing, orderly marketing, live stock production, marketing information, transportation and finance.

Some live stock organizations fairly and ably represent special live stock interests or regions of production. Yet these for the most part have not been sufficiently financed, nor are they sufficiently national in scope to function strongly and effectively.

The need for a national live stock organization representative of a very large number of the rank and file of live stock producers in all parts of the United States has long been felt. Such an association properly financed and directed should be able to represent wisely and with authority the live stock producers' interests, wherever and whenever they are concerned.

The Committee has come to feel that such an organization can best be built with more efficient live stock marketing as its primary purpose. Without becoming a burden to anyone, such an organization should grow to be largely representative of live stock producers and easily become self-supporting.

The building of such an organization hinges upon the willing-

ness of live stock producers to co-operate in marketing their live stock, and it is convinced that until they do so co-operate, there is little hope of substantial and permanent improvement in live stock marketing.

The co-operative marketing plan approved was built from the ground up. The individual livestock producers of the United States constitute the foundation. Producers are being strongly urged to join the local co-operative livestock shipping associations. However, if for any reason they do not find it to their advantage to do so, they may still avail themselves of the selling-at-cost features by consigning their stock direct to a producers' livestock commission association that is owned and controlled by livestock producers themselves.

Producers' Co-operative Commission Associations

When the National Live Stock Producers' Association, which is the name of the national organization, receives assurances that there are sufficient patronage and sufficient memberships to finance the undertaking, there are established at the terminal markets producers' livestock commission associations and the allied stocker and feeder companies. These are co-operative, savings or earnings being returned to patrons on the patronage dividend basis, with service rendered at cost. Each of the co-operative commission associations at the various terminals is entitled to representation on the directorate of the National Live Stock Producers' Association. The national board of directors has for its functions to federate, correlate, standardize, supervise, and promote co-operative livestock marketing through the terminal commission associations and other agencies and a number of co-operative commission associations already established.⁷

⁷ Wolf, O. O., "The National Live Stock Producers' Association," in *The Kansas Stockman* (Mar. 15, 1922), p. 6. The directors serve without compensation with the exception of traveling expense. It was felt that men should be placed on the board who are substantially enough interested in the livestock of the country to make a little sacrifice of time. The officers chosen in 1922 were J. G. Brown, Monon, Indiana, President; Charles E. Collins, Kit Carson, Colorado, Vice-President; E. H. Cunningham, Des Moines, Iowa, Secretary-Treasurer. See also an editorial in *The National Provisioner* (Nov. 5, 1921), Vol. 65, No. 19.

This plan is a very comprehensive one, and it is possible to consider only the more important aspects of it here. First, it ought to be noted that it does not represent inclusive co-operation, that is, it does not take in all the interests in the meat industry, producers, commission men, packers, and others. The intention is avowedly to turn over control of the machinery of marketing livestock to the producers, the method of offer and sale itself, which was developed a half-century ago in the way described earlier in this book, not being changed in the process. Further, it does not include all the elements among the producers.

Not Inclusive Co-operation

The situation caused a split among the various elements of the producers as to the co-operatives, which has been summed up in an editorial in *Wallace's Farmer* as follows:

The farm forces working for co-operative live stock marketing at the terminals seem to be splitting into two rival groups. The National Live Stock Producers' Association, sponsored by the Committee of Fifteen, is being opposed by the Farmers' National Co-operative Live Stock Marketing Association, an organization supported by the eight commission companies already in existence at different markets. This includes the Farmers' Union companies of Omaha, Sioux City, Denver, Kansas City and St. Joseph, the Equity firms at Chicago and South St. Paul, and the Missouri Farm Clubs Commission Company at St. Louis.

This division may have one of two results: It may mean chaos, a tooth and nail fight that will result in the extinction of both groups. It may mean a spirited rivalry in giving service to the farmer, a rivalry that will strengthen the efficiency of both. Live stock commission men are, of course, hoping for the first result. The farmers in both camps can hardly do anything else than work for the second.⁸

It would seem that something more inclusive in co-operation will have to be worked out along the lines of co-operation for regulation of the shipment and price stabilization plans

⁸ *Wallace's Farmer* (March 10, 1922), Vol. 47, No. 10.

that have already been attempted, but in order to make that a success, there will have to be inclusive co-operation. The plan of hog price control was not a success until all elements in the industry were included. The packers, who are expected to absorb all that is sent to market at whatever time, or in whatever quantity, to pay cash on the spot and then find a quick market for all the products, all of which adds problems to the business and results in violent fluctuations, are in favor of such co-operation.

Packers Favor Co-operation

President Thomas E. Wilson of Wilson and Company and also of the Institute of American Meat Packers, in a recent address stated that :

More than a year ago I recommended before the House Committee on Agriculture, and again recently before the National Agricultural Conference called by the President, the enactment of a Federal Law authorizing farmers and other producers of agricultural products to organize under appropriate supervision, for the purpose of marketing their products in an orderly manner, in order to prevent gluts and wastes and to regulate the supply more in accordance with the actual demand, to the end that violent and unusual fluctuations might be eliminated and values established.⁹

J. Ogden Armour also declared that: "Through co-operative marketing should come stability both as regards supply and price, together with the elimination of waste and the lessening of costs."

It is interesting to note that in order to legalize a fact, co-operative marketing associations of producers have recently been authorized by a federal law stating :

That persons engaged in the production of agricultural products as farmers, planters, ranchmen, dairymen, nut or fruit growers may act together in associations, corporate or otherwise,

⁹ "Mutual Problems in the Livestock and Meat Industry," an address delivered by Thomas E. Wilson before the annual convention of the Texas and Southwestern Cattle Raisers' Association, Fort Worth, March 15, 1922.

with or without capital stock, in collectively processing, preparing for market, handling, and marketing in interstate and foreign commerce, such products of persons so engaged. Such associations may have marketing agencies in common; and such associations and their members may make the necessary contracts and agreements to effect such purposes.¹⁰

Co-operative Livestock Producers' Commission Companies

As the plan of the American Farm Bureau Federation stands now, it is being put into effect by the newly formed National Live Stock Producers' Association, whose first aim is to establish co-operative commission companies at the leading terminal livestock markets. The one set up at St. Louis, which is known as the Producers Livestock Commission Association, began business in January, 1922, and has done well, often ranking first among some 55 firms in weekly business. At present there are plans for opening offices in Chicago, Indianapolis, Buffalo, Pittsburgh, Cleveland, Cincinnati, Toledo, and Detroit. In fact it is claimed that within twelve months companies of the National Live Stock Producers' Association should be operating on at least twelve markets. If conditions warrant and local stockmen demand it, an office will be established upon any livestock market.

Advantages of Co-operative Companies

The advantages urged by the leaders in this co-operative commission company movement are as follows: (1) there will be a lessened margin between producer and consumer; (2) co-operative marketing tends to broaden the vision and knowledge of the producer; (3) it distributes profits back to the producer after deducting proper cost for handling; and (4) it limits concentration of power also and tends to distribute wealth.

It is further pointed out by President John G. Brown of the National Live Stock Producers' Association that:

¹⁰H. R. 2373, An Act to authorize association of producers of agricultural products, Approved February 18, 1922.

The taking over by the farmer of the activities connected with the marketing of his livestock does not offer anything new or revolutionary in the plan usually followed in distributing products. It is the usual, rather than the unusual, for manufacturers, or producers of raw products, to sell the output of their own plants or mines. The farmer may be classed as a manufacturer, and surely his being a producer of raw products can not be denied. Let us take a lesson from efficient business concerns and establish and support our own marketing agencies for live stock.

Mr. Brown also maintains that:

There is no question but that cooperative commission companies can hire men of as good ability as can the old line firms. The majority of persons connected with the commission business are on a salary basis, and are willing to work where they can get the most money and where their opportunities are the greatest. In fact, since we have started operation we have had scores of applications not only from paid employees, but even the owners of many old line commission firms have offered to sell to us and go to work for us.

Again it is asserted that:

Selling agencies at the centralized live stock markets are essential; but in the years that have passed the commission firms at all markets have increased faster than the volume of business warranted. A result has been the constant "pyramiding" of commission charges. Service rendered has not been the factor determining the amount of the commission charge, but rather the necessity that the large army (constantly increasing) engaged in the business get enough pay to enable them to live according to the high standards to which they are accustomed. Another disturbing thing to the patrons of the commission firms has been the lack of any concerted attempt on the part of the commission men to make any fundamental changes in the method of handling the farmers' business.

Disadvantages of Co-operative Companies

There are, however, certain disadvantages of co-operative commission companies that have to be considered. These have

been stated by President Everett C. Brown of the National Live Stock Exchange to be:¹¹

1. While it is claimed by the supporters of co-operation that the new firms will pay large dividends, it is not at all clear that they will succeed in the chief concern of a livestock commission firm, namely, obtain the highest market values. Experience of the last few years shows that co-operative firms have often not obtained as high prices as regular commission firms. Livestock salesmen cannot be made in a few days. The ability of many of the salesmen of the co-operatives is not as high as in the regular companies.

2. Actual working of co-operative companies in large markets shows that they often received more livestock than they could handle efficiently. The result was that their own organization was glutted with stock and forced sales at bargain-counter prices, because there was not the element of competition.

3. There is no truth in the statement of the co-operatives that regular livestock commission men are making exorbitant charges. The fact is that for the many services rendered, including yarding, sorting, selling, weighing and remitting, the commission man is the poorest paid of any of the agencies handling the products of the farm. For years the commissions charged for the sale of livestock did not average one-half of one per cent, and a recent government report states that in 1920 the charges did not average three-fifths of one per cent.

Haugen Act and Commission Companies

Whether or not the advantages or disadvantages outweigh each other, per se, in the matter of co-operative commission companies, the fact is that all have had their status affected by the Packers and Stockyards Act, 1921. By this law commission men as market agencies and dealers are put under the authority of the Secretary of Agriculture, who has prescribed

¹¹ National Live Stock Exchange Bulletin, November 15, 1920.

rules and regulations for carrying out the provisions of the law, but they are not to prevent the legitimate application of any valid by-law, rule, or regulation of livestock exchanges which is not in conflict with the act.

The livestock commission men recently contested this new federal supervision on the ground that it will hinder and not aid the functioning of the terminal markets. In two cases they brought suit against the Secretary of Agriculture to test the constitutionality of the act, one being brought by T. F. Stafford *et al.*, representing the livestock commission men, and the other by James E. Burton *et al.*, representing the livestock traders or buying agents.¹² The federal government contended that the Secretary has authority over the commission men because of its jurisdiction over interstate commerce. It was stated that the stockyards are a part of interstate commerce as terminals of transportation systems between states, and as a consequence, men doing business there are engaged in interstate commerce. On the other hand, the commission men contended that their business is not a part of interstate commerce. In their view, livestock completes its rôle in interstate commerce when it reaches the stockyards, and while in the stockyards is not under the jurisdiction of the federal government. The fact was cited that by far the greater proportion of the livestock received at central markets never re-enters interstate commerce at all, since the flow from stockyards to the consumer is in the shape of meats and by-products.

Supreme Court Upholds Act

Both these cases were carried on appeal from the United States district court for the northern district of Illinois to the Supreme Court of the United States. On May 1, 1922, Chief Justice Taft rendered the decision of the court in both these cases together. This decision held that the act was clearly within congressional power and valid, and that livestock com-

¹² *The National Provisioner*, March 25, 1922.

mission firms and traders were engaged in interstate commerce. In the course of his opinion the Chief Justice said:

The stockyards are not a place of rest or final destination. Thousands of head of live stock arrive daily by carload and train-load lots, and must be promptly sold and disposed of and moved out to give place to the constantly flowing traffic that presses behind. The stockyards are but a throat through which the current flows, and the transactions which occur therein are only incident to this current from the West to the East, and from one State to another. Such transactions can not be separated from the movement to which they contribute and necessarily take on its character. The commission men are essential in making the sales without which the flow of the current would be obstructed, and this, whether they are made to packers or dealers. The dealers are essential to the sales to the stock farmers and feeders. The sales are not in this aspect merely local transactions. They create a local change of title, it is true, but they do not stop the flow; they merely change the private interests in the subject of the current, not interfering with, but, on the contrary, being indispensable to its continuity. The origin of the live stock is in the West, its ultimate destination known to, and intended by, all engaged in the business is in the Middle West and East either as meat products or stock for feeding and fattening. This is the definite and well-understood course of business. The stockyards and the sales are necessary factors in the middle of this current of commerce.

The Act, therefore, treats the various stockyards of the country as great National public utilities to promote the flow of commerce from the ranges and farms of the West to the consumers in the East. It assumes that they conduct a business affected by a public use of a national character and subject to national regulation. That it is a business within the power of regulation by legislative action needs no discussion. That has been settled since the case of *Munn v. Illinois*, 94 U. S. 113. Nor is there any doubt that in the receipt of live stock by rail and in their delivery by rail the stockyards are an interstate commerce agency. *United States v. Union Stock Yards Co.*, 226 U. S. 286. The only question here is whether the business done in the stockyards between the receipt of the live stock in the yards and the shipment of them therefrom is a part of interstate commerce, or is so associated with it as to bring it within the power of

national regulation. A similar question has been before this court and had great consideration in *Swift v. United States*, 196 U. S. 375. The judgment in that case gives a clear and comprehensive exposition which leaves to us in this case little but the obvious application of the principles there declared.¹³

The National Livestock and Meat Board

A very recent phase of co-operation in the meat industry which is wider than any yet considered, is the one adopted at the annual convention of the American National Live Stock Association in Colorado Springs in January, 1922. This resulted in the formation of the National Livestock and Meat Board in which producers and packers are co-operating. It has a membership of 17, and this membership is representative of every element in the industry, in that particular differing widely from that of the recently ratified plan of the American Farm Bureau Federation. The proportion of the membership of the board is as follows:

Eleven members representing producers' associations and apportioned two to the American National Live Stock Association; National Swine Growers' Association, two members; National Wool Growers' Association, one member; American Farm Bureau Federation, two members; Texas and South-western Cattle Raisers' Association, one member; National Society of Record associations, one member; Corn Belt Meat Producers' Association, one member, and Kansas Livestock Association, one member. Two members are to represent the Institute of American Meat Packers, two members represent the commission men and two members represent the retailers of meat. An executive committee will carry out the purposes for which the board is formed.

Even the method of financing this movement is to rest equally on the two sections of the industry, for there is to be a collection of 5 cents from the shipper to an established market

¹³ U. S. Sup. Ct. Nos. 687 and 691, October term, 1921. T. F. Stafford *et al.* v. Henry C. Wallace, Secretary of Agriculture, and Charles F. Clyne, U. S. Attorney for the Northern District of Illinois; and J. E. Burton *et al.* v. Charles F. Clyne.

on each car of livestock, or at that rate on less than carload lots, and an equal amount from the buyer.

Has Opportunity for Constructive Work

The purpose of this board is to conduct and direct an adequate educational campaign, counteracting the widespread and insidious propaganda against the food value of meat, and disseminating through all possible avenues correct information about meat in the diet, with a view to increasing meat consumption, in co-operation with the United States Department of Agriculture and other appropriate agencies, and to take such other steps as may seem proper to create a wider market for, and an increased consumption of livestock products.

The scope of the activities of the board, however, is wide enough to permit of action on problems that have hampered effective and economical marketing, both of livestock and meats. Its formation realizes, at least in form, the "inclusive co-operation" that seems necessary for success in solving the problems of marketing.

These problems are so great that there has been no attempt at bold prophecy as to when or what changes are to be made in our livestock marketing system, but a careful analysis of the problems, and a statement of the various solutions attempted and plans being tried out, are of value to the student. Such history gives a basis for reflection. In the words of Professor Andrew C. McLaughlin of the University of Chicago:

From War to Co-operation

History reading is a wholesome diet for the conservative, for he will discover that, while the past can not be destroyed, it can not be preserved unaltered. The historical minded man is sure of one thing; the social order is going to change; for better or for worse, change is coming; life is a series of accommodations and readjustments. The reader of history finds that while a generation of men are anxiously attentive to what appears to be the conspicuous tendency of their day, there is and has been

an unseen current carrying them towards a condition they have not dreamed of. He will probably find that no generation quite knows itself, because its deeper significance can be comprehended only when one sees its product, and the product is only fully disclosed by the next generation or succeeding stage. The impatient radical and the choleric conservative may, if they will, from history learn modesty, and may each gather respect from the opinion of the other.

One of the trying and disturbing manifestations of modern American life is the mental immobility of the conservative, for conservatism so easily becomes obstinacy, and obstinacy begets intolerance, and intolerance makes fellowship and understanding impossible, and misunderstanding foment quarrels. Whether we like it or not, changes are going to come. Let the immobile minded man read history; he is likely to find, if it be real history, that he will be inclined not simply to watch the wake of the vessel, but to peer ahead to see whither the next turn of the wheel may take him. He may, for example, be passing from a world of war to a cooperative world; things as strange have happened.

PART IV
THE PACKING INDUSTRY IN ITS PUBLIC
RELATIONS

CHAPTER XXXI

LABOR IN THE PACKING INDUSTRY TO 1904

Labor of Vital Importance

Labor is of vital importance in the meat packing industry. It has given rise to problems which, on account of the nature of the business, have become matters of great public interest and controversy. The packing industry is, moreover, the typical American large-scale business, and in it is to be found the highest development of that phenomenon of modern industry, division of labor.

In a study of labor in this industry it is well to consider first this remarkable division of labor, which developed naturally from the nature of the packing business, even if in doing so there is risk of some repetition of previous chapters.

Complexity of Packing Industry

One of the chief characteristics of the packing industry is its complexity. From the point of view of functions performed, it is a collection of four fairly distinct enterprises, each performing a different function. These functions may be enumerated as follows:¹

1. Slaughtering and meat-packing
2. Specialized manufacture of by-products
3. Storage of products
4. Distribution or jobbing.

True, there are many small concerns that perform only one of these functions. Some packers, for instance, are interested

¹ The Theory of Packing House Accounting, prepared by the Committee on Standardized Cost Accounting of the Institute of American Meat Packers, Chicago.

chiefly in the slaughtering function. They sell their raw by-products to other establishments, engage little, if at all, in the storing of products, and are dependent on the local market for the sale of their meats. Other concerns may confine themselves to storing the products of the packinghouses. There are still others which do not engage in the slaughtering of animals, but manufacture into finished products the raw by-products derived from slaughtering. Finally, there are concerns which devote their attention entirely to the distribution of packinghouse products. They neither slaughter, store, nor engage in the processing of by-products. Here and there are establishments which perform two, three, or all four of these functions.

The performance of any one of these four functions requires a special plant and machinery, special personnel, and special accounting. Each function constitutes a business in itself, so that the large-scale packing enterprise today represents not one industry, but a succession of related industries.

The organization of the industry is further complicated by the fact that even in the performance of one function, such as the processing of by-products, a single concern may be a collection of businesses. In addition to the slaughtering of animals and sale of meat, a packer may be engaged in making sausage, canning meat, etc. He may operate a soap factory in order to utilize inedible greases, or an oleomargarine factory for the utilization of edible oils. He may also engage in the manufacture of glue, commercial fertilizer, and a whole variety of products in some of which only a small portion of raw material comes from slaughtered animals.

In order to utilize fully their physical equipment and sales organization, some packers have seen fit to engage in the production or merchandising of such products as poultry, eggs, cheese, butter, lard substitutes, etc. These activities may require the operation of storage plants, power plants, box factories, mechanical supply departments, etc.

Departments of a Packing Plant

To make the accounting procedure fit the peculiarities of the business, a modern packing plant is usually divided into departments, each dealing with a specific product, or a group of related products. The usual departments are:

1. Cattle killing department.
2. Hog killing department.
3. Sheep killing department (including in this department employees in plants where the sheep killing gang also kill and dress calves).
4. Offal department, divided in three divisions:
 - a. All offal except hides and casings (heads, tongues, livers, hearts, feet, paunches, ox tails, bones, and fat).
 - b. Hides.
 - c. Casings.
5. Fresh beef department (cooling, cutting, trimming, packing, icing, and shipping).
6. Fresh pork department (cooling, cutting, trimming, packing, icing, and shipping).
7. Lard and oleo oil department.
8. Sausage department.
9. Cured meat department.
10. Canning department.²

By considering briefly two sections of the industry, the cattle business and the hog business, the degree to which specialization of labor has gone will be made clearer.

Division of Labor in the Cattle Business

The slaughter of cattle and the disposition of by-products and dressed meats is essentially a disintegrating, or breaking-up operation. The cattle are purchased alive and are taken into the slaughter house, where they are killed and dressed. The by-products from the slaughter of these animals are transferred from the killing floor to the respective by-products department. The dressed carcasses of beef are transferred from the killing floor to the cooler, where they are chilled until

² "Wages and Hours of Labor in the Slaughtering and Meat-packing Industry." U. S. Department of Labor, Bureau of Labor Statistics No. 252 (1917), p. 7.

the animal heat has entirely disappeared. These carcasses are then disposed of from the cooler through the following channels :

1. Consignments to selling agencies.
2. Direct sale to customers.
3. Transfers to the cutting department, where carcasses are cut up and disposed of in the form of cuts.
4. Transfers to the freezer for freezing and storage.³

These operations are the basis for the cost figuring and for the departmentizing of the operations and accounting of the cattle business. Figure 24 (page 424) showed the course of the operations and divisions into departments as it appears to the accounting department.

As the animals are slaughtered, the by-products—hides, fats, etc.—are transferred from the killing floor to their respective departments, where they are put in merchantable shape to be sold. The hides are transferred to the hide cellar, where they are salted down in packs and cured. The edible fats are transferred to the oil house where they are melted into oleo stock, which is usually pressed into oleo oil and stearin. Inedible fats are transferred to the tank house for rendering, producing tallow, or grease and tankage. The small products, or edible by-products, are transferred to separate departments, where they are trimmed and packed for shipment. The killing and chilling operations are all included in the cattle killing department. The purpose of this department is to show the break-up of the animals into by-products and carcasses of dressed beef.

The scope of the cattle business is briefly indicated by Fig. 24 (page 424). That it should be carefully defined is important in order that statistics prepared and results computed may be on a sound and recognized basis. The cattle business should include :

³ Tentative Draft of Proposed Accounting Instructions on the Cattle Business, prepared by the Committee on Packinghouse Practice of the Institute of American Meat Packers, Chicago.

1. All cattle buying, killing, and dressing operations.
2. Disposition of carcasses.
3. Cutting of carcasses and disposition of cuts.
4. Preparing or processing of by-products to their marketable stage and the disposition of them.

Assuming, however, the usual processing of by-products, the following would be included in the cattle business:

1. Hides. The curing and marketing of cured hides, including their delivery to cars ready for shipment.
2. Edible fats. Including melting or rendering of edible fats into oleo oil, stearin, and tallow, and the sale or shipment of such products.
3. Tongue. Includes preparing of fresh tongues, freezing, pickling, or smoking and the delivery of product by shipment or transfer.
4. Small products (offal). Includes the preparing and packing of fresh offal and any freezing. Closes with the delivery of such product by shipment or by transfer to other departments.
5. Casings. Includes all operations of the casing department to the delivery of the finished casing by shipment or transfer.
6. Tank stock. Includes the rendering of all animal products in tanks and the storing, tiercing, or bagging, and shipping or transferring of all rendered products comprising tallow, finished tankage, and dried blood.
7. Bones and miscellaneous. Includes the cooking, drying, grading, bagging, and shipping of bones, horns, horn piths, hoofs, sinews, etc.

Division of Labor in the Hog Business

The hog business begins with the buying of the live hogs in the public stockyards, or in some cases through country shippers and from the farmers direct, and ends with the marketing of the pork products—fresh, cured, smoked, and cooked—and manufactured by-products. It includes the following operations:

- Buying
- Killing and dressing
- Cutting up carcasses
- Saving and preparing small products (offal)
- Saving and processing by-products
- Rendering lard
- Rendering grease
- Refined lard
- Storage of products
- Curing of pork products
- Smoking of pork products
- Cooking of pork products
- Marketing of all pork products

All manufacturing, processing, and marketing transactions in connection with the foregoing operations are part of the hog business, and are, therefore, included in the "hog section" of the present-day packinghouse.

From the preceding enumeration of functions it is clear that operations of the business, and therefore the labor, have been and must be minutely subdivided.⁴ Many of the operations demand skilled labor, but the majority, amounting to at least two-thirds of the total operations, require only unskilled labor. Of the skilled workers, the most proficient are the cattle butchers. They have to be so, because of the character and expensiveness of the material with which they deal, making it possible by a slight cut to do more damage than any other worker. To aid the division of labor the animal is surveyed and laid off like a map, the men being classified in more than 30 specialties and 20 rates of pay, as a list of various workers shows.⁵

⁴ The most authoritative source for the various kinds of work done and extent of division of labor in the packing industry is "Descriptions of Occupations, Slaughtering and Meat-packing," prepared for the U. S. Employment Service by the U. S. Bureau of Labor Statistics (1918), pp. 38-43.

⁵ Cattle Killing: Drivers and penners, knockers, shacklers or slingers, head holders, stickers, headers, droppers and pritchers up, foot skimmers, leg breakers, rippers-open, gullet raisers, floormen or siders, breast or brisket breakers and sawyers, crotch breakers, hoisters, tail rippers and pullers, bung droppers, rumpers, fell cutters, fell pullers and beaters, backers, gutters, shank skimmers, hide droppers, tail sawyers, splitters, scribes, trimmers, utility men, washers and wipers, butchers, general, tonguers, laborers, and truckers.

Objects Gained by Division of Labor

Professor John R. Commons has pointed out that three objects were gained by this division of labor.⁶ First, cheaper man power—unskilled and immigrant labor—could be utilized in large numbers. Second, skilled men became more highly expert in the quality of their work. The proportion of low-wage men was greatly increased, while the wages of the very few skilled men on the delicate and particular parts of the work were advanced. These skilled steady-time men also acted as pace-setters. In this way the third object of division of labor was brought about, namely, speed. As an example, take splitting. In 1884 five splitters in a certain gang would get out 800 cattle in 10 hours, or 16 per hour for each man, the wages being 45 cents. In 1894 the speed had been increased so that 4 splitters got out 1,200 cattle in 10 hours, or 30 per hour for each man, an increase of nearly 100 per cent in ten years. The wages except for the steady-time men were reduced during the same period to 40 cents per hour. This naturally came to be considered a legitimate grievance on the part of the men.

Nationalities in Packinghouse Labor

A matter closely allied to division of labor is the nationality and type of labor—skilled and unskilled—employed in the stockyards. When the packing industry was first established in Chicago the Irish nationality was the principal one represented.⁷

From 1880 to 1886 the nationalities employed, in order of numerical importance, were the Irish, Americans, Germans, and a few Scotch.⁸ The great strike of 1886 disrupted the only organization of labor in the yards—that of the Knights of Labor—and after the failure of the strike there began a great

⁶ "Labor Conditions in Meat-packing, and the Recent Strike," *Quarterly Journal of Economics* (Nov., 1904), Vol. XIX, p. 6. This is the ablest statement of the situation.

⁷ The labor conditions discussed in this chapter are for the most part those in Chicago as the chief meat-packing center.

⁸ U. S. Bureau of Labor Bulletin, No. 56 (Jan., 1905), letter of Commissioner to the President on Influence of Trade Unions on Immigrants.

exodus of Americans and the more active men among the Irish. The Poles first came into the yards in 1886 after the settlement of the strike, but not as strike-breakers.

This Polish immigration seems to have been voluntary, increasing to such an extent that by 1890 most of the unskilled occupations were filled by Poles who by 1894 had practical control of the common labor. In that year the Bohemians began noticeably to affect the situation. They went first into the inferior positions, which they shared with the Poles. Soon, however, the Bohemians outstripped the Poles in the movement upward from unskilled to skilled occupations.

The big strike of 1894 unsettled these movements temporarily. Negro labor, used to break the strike, has been an element in the situation ever since. In 1890 but one negro was employed in the yards, and he worked in Armour's killing gang. While few of the strike breakers of 1894 were retained, yet that event marks the real beginning of the employment of negroes. By 1904 there were some 500 employed.

After the settlement of the strike of 1894, the Bohemians were introduced more rapidly and this continued up to 1896. In 1895 the Lithuanians began coming in, followed by Slovaks in 1896, and this went on steadily until 1899, when the number began to increase rapidly. Because of the threatening war between Russia and Japan and the consequent rush of the people to escape compulsory military duty, an enormous influx of Lithuanians, Slovaks, and Russian Poles crowded the labor market in the yards in 1903 and 1904. The most disagreeable and lowest paid work was done by these Slovaks and Lithuanians. These with the negroes seem contented to remain at that low level. They do not press up like the Poles or Bohemians, while the Italians and the Greeks now shun the yards.⁹

In 1911 the Immigration Commissioner's report gave the percentage of foreign-born employees in the meat industry as

⁹ Parker, Carleton H., "The Labor Policy of American Trusts," *Atlantic Monthly* (Feb., 1920), Vol. CXXV, No. 2.

60 per cent. One of the largest of the Chicago packinghouses estimates that whereas the English-speaking races formerly made up a little over three-fifths of the workers in the plant, today they number about one-third. The Germans have decreased by over one-third, and the Bohemians by almost one-half. On the other hand, the Poles and Slovaks have increased in numbers by almost 50 per cent, and the Lithuanians, Russians, and Hungarians by 388 per cent.

Women in the Packing Industry

In this industry, as in others in which work was originally monopolized by men because it was thought unsuitable for women, the division of labor and the invention of machinery have so reorganized the business that a large number of processes have been discovered at which women may be successfully employed. In the packing industry the further observation may be made that the early exclusion of women was due to the repulsive character of the work, as well as the fact that physical strength was required.¹⁰ In time, however, women came to take part in many operations of the packing plants, but no women were found in the killing room or on the cutting floor, or are now.

Today the first time the meat passes under the hands of women is in the trimming room. There is no machinery, and the women perform with a knife the very simple operation of separating the fat from the lean and both from any bones. There is nothing repulsive in this except in so far as the handling of the large quantities of uncooked food is always in some measure unpleasant. In all departments where women handle meat, they wear caps and aprons and work very much as in a private kitchen. The women in the trimming and sausage rooms are the only ones who have taken over any part of what was men's work under the older and more primitive system.

¹⁰ Abbott, Edith, and Breckinridge, S. P., "Women in Industry; The Chicago Stock-yards," *Journal of Political Economy* (Oct., 1911), Vol. XIX, p. 632. A very interesting detailed description of the work of women in the packing plants of Chicago.

In all the processes connected with the preparation of cooked meats for the market and the manufacture of the great variety of by-products, both women and men are doing new work which has been created by the invention of machinery and the remarkable organization which has made possible the utilization of by-products. This work did not exist at all under the old system.

The great majority of girls and women perform simple unskilled mechanical processes, such as are carried on in large numbers of factories all over the country. If the canning department, for example, were outside of the yards, the character of the work would not distinguish it from thousands of other factories. In the yards, however, it is surrounded by somewhat unpleasant conditions that are characteristic at times of these great slaughter houses. These conditions of work and also the condition of stockyard workers have been a matter of public interest and controversy for many years.

"The Jungle" Not a True Picture

In 1906 the whole matter was aired in the public press, the initiator being Upton Sinclair in his novel, "The Jungle." This piece of fiction of undeniable power was very widely read,¹¹ and it may be as a result of this and the natural development of the industry there was passed the Federal Meat Inspection Act of 1906.

The question, therefore, at once arises, was "The Jungle" true? Sinclair wrote an article in *Everybody's Magazine* in May, 1906, under that title, declaring that it was true. Inquiry shows that Sinclair was undoubtedly sincere and it may be that individual facts in "The Jungle" were true, but the workers in the stockyards and others who knew conditions there at that time state that Sinclair brought into his picture

¹¹ Sinclair, Upton, *The Brass Check*, p. 34. Some other books were published about this time alleging bad conditions in the packing industry, e.g., "The Dark Side of the Beef Trust" (1905), published anonymously, and "20 Years in Hell with the Beef Trust," by Roger R. Shiel, Indianapolis (1909).

facts covering no one given time, but some 20 years of development in the industry. Thus the artistic effect of horror was heightened, but stories of the man falling into a tank of edible products and of boys being eaten by rats were not typical, indeed, were not true.

The fact was, however, that working conditions were bad enough without any embellishments.

That a union had to be organized and threaten a strike in order that the owner of the business might learn of conditions of which his own conscience promptly disapproved is a fact full of meaning for all who are disturbed by the movement of labor.¹²

The packing industry developed so rapidly and became so complicated with worlds within worlds that the employers came to leave to others the relations with employees and the working conditions. From time to time when specific cases were brought to their attention remedy was made, but until within the last few years, which are considered in the following chapter, no statesman-like attitude or policy was worked out. For this the packing companies not only in Chicago but in other centers can be criticized, but at the same time it is well to realize that there was little more done in other industries. Only in recent years has the workman received more adequate consideration in industry.

Working Conditions in 1906

"Packingtown" in 1906 was the popular name of this community where some 50,000 people earned their living. It was long the home of nuisances. One great tract was given over to slaughtering and the industries built upon it and beyond it was a dump. A fork of the Chicago River served for purposes of drainage, but there was no flow of water, and such sewage and scum accumulated that it bubbled with gases of decomposition and was known as "Bubbly Creek." The air of the city

¹² Commons, John R., "Labor Conditions in Meat-packing, and the Recent Strike," *Quarterly Journal of Economics*, Vol. XIX, No. 1, p. 14.

in the neighborhood was always full of offensive odors from Bubbly Creek, the yards, and from the processes connected with slaughtering and packing, and the manipulation of fertilizer.¹³

Inside the packinghouse it was natural that for a time no special attempt was made to protect the health of the workmen.¹⁴ Many of the packers had themselves handled living and dead animals and so saw nothing shocking in it. They applied the same rule to themselves as to others. Here was a job which implied blood and a dark room. It paid a certain number of cents an hour. If a man wanted it, he endured the blood and the dark room and got his money. The relation between the packer and the worker was then over. To many individual workers the packers were probably generous. To the mass of them they were neither generous nor ungenerous.

Some features of the work in the stockyards would have been difficult to remedy, even if the beef business were a philanthropic experiment. The hide cellar, for instance, had to be wet, and dark, and there could be no currents of air, for if there were the hides would spoil. Yet, men had to work in that place in order that the country might have leather. This held good in many other parts of Packingtown. The cooling rooms were damp and chilly and the killing floors were bloody. Specialization here as in other trades resulted in keeping a man at one particular kind of work, which in some cases impaired his health. It was therefore only fair to restrict the packers to their share only of responsibility for some of the necessary accompaniments of modern industry.

Living Conditions in 1906

To turn to living conditions, the great majority of the unskilled laborers lived in the district known as "Back of the

¹³ Hard, William, "Labor in the Chicago Stockyards," *The Outlook*, June 16, 1906.

¹⁴ This is based on statements of "old-timers." For an extensive and scholarly study of the stockyards district, now in many respects out of date, see Bushnell, Charles J., "Some Social Aspects of the Chicago Stockyards," *American Journal of Sociology*, October, 1901, to March, 1902.

Yards," in the west and southwest sides of the yards, where they grouped themselves largely according to nationality. Due to the incoming of new races there was a constant shifting of population southward, the older races going further south and leaving space for others.

Here were to be found prototypes of the characters in Sinclair's "Jungle" whose home life was much below what many considered an American standard of living. They came, however, from places where they lived in such conditions at even less cost, and it was natural that when they came they lived the life and kept the social and economic standards to which they were accustomed.¹⁵ This applied with special truth to the Lithuanians and Slovaks who cherish many picturesque customs.¹⁶

Such made up most of the poorly paid labor in the stockyards. Though receiving only 16 cents an hour or less, they were able to lay by a good part of their earnings. For 18 cents a day of 12 or 14 hours in the Carpathian foothills became 18 cents an hour in the stockyards. In 1906 it was, and even in 1922, is still customary, though to a less degree, for these men to board in groups at the home of a fellow countryman.

The landlady buys provisions at the grocery and meat market for each of the boarders separately and a separate book account is kept for each of the men at the store for such purchases. Each boarder pays his own book account at the store and for his lodging and washing. All the laborers buy meat and beer (1907), the food and drink they most enjoy. They could never have indulged in such high living in their native country, and they have all been accustomed before entering the stockyard district to living in crowded quarters.¹⁷

Comparatively few of these people complained about their conditions. Indeed, outsiders speaking deprecatingly of their

¹⁵ Thompson, C. W., "Labor in the Packing Industry," *Journal of Political Economy* (Feb., 1907), Vol. I, No. 2, p. 88.

¹⁶ *Ibid.*, pp. 93, 94. Also "The Jungle," Chap. I, for a description of a wedding celebration. See Bushnell, C. J., "Some Social Aspects of the Chicago Stockyards," *American Journal of Sociology*, Vol. VII, 1901-1902.

¹⁷ Thompson, C. W., *op. cit.*, p. 95.

standard, or showing signs of pity, were apt to be met with resentment. All of which goes to show that the district did not differ from many others in Chicago, and there are many where people are crowded much more tightly and indecently. These people of each race in the stockyards had their own societies and clubs and all belonged to the same church. They were a world unto themselves.¹⁸

Such was the situation about the beginning of this century. But by that time influences were at work, which were to change their condition.

Labor Unions in the Packing Industry

Prior to 1897 the meat cutters and butcher workmen in the packing industry were only organized in a few widely scattered cities. There were, at the close of the year 1896, 12 local unions of these workers, affiliated with the American Federation of Labor, and 2 other unions entirely independent of any labor organization. Of these locals, however, 5 were almost extinct. The total membership, even including these 5 unions, did not exceed 300 butchers. On the other hand, the meat industry of the country, both wholesale and retail, had in large part been concentrated in a few of the larger cities. It was hopeless for a small local union to attempt to cope with an employing firm. The demands of the employees were, indeed, generally ignored by the packers, and attempts to organize unions were stopped.

It was in order to maintain relations with the heads of the great packinghouses upon more equal terms that an international union, known as the Amalgamated Meat Cutters and Butcher Workmen of North America, was chartered in January, 1897, by the American Federation of Labor. By the time of the first convention in December, 1897, the international

¹⁸ For further details, see United States Bureau of Labor Bulletin No. 56 (1905), pp. 3-8.

union had under its jurisdiction 28 locals, and immediately prior to the great strike in the summer of 1904, the number of locals had increased to nearly 400, with a total membership of 75,000.¹⁹

Amalgamated Meat Cutters and Butcher Workmen

The rise of the bigger packing concerns not only hastened the growth and strengthened the power of the international organization, but also necessitated an increase in the size of the unit of government. In order to oppose to the larger packers one single, solid body, it was decided at the convention of the American Federation of Labor, held at Nashville, Tenn., December, 1897, that the Amalgamated Meat Cutters and Butcher Workmen should include every wage earner who handles meat, from the man who takes the bullock by the hoof to the retail clerk who cuts the meat for the consumer. Nevertheless, the Amalgamated Meat Cutters and Butcher Workmen can not in a strict sense be called an industrial union. It includes only those employes who handle meat and utilize the by-products; and these men may, with some stretch of the imagination, be considered members of a single craft. Unlike the Brewery Workers, and a few other international unions, the Amalgamated does not include the members of those auxiliary trades, such as the stationary firemen, the stationary engineers, the coopers and the teamsters, who, while an integral part of the machinery of production, are yet quite distinct from the main body of workers.

The history of the Meat Cutters' and Butcher Workmen's Union has demonstrated that this exclusion of the auxiliary trades possess certain advantages and certain disadvantages. On the one hand, the butchers have avoided the difficulty of trying to harmonize with themselves, distinct trades of whose needs, interest and technique their officers are probably wholly ignorant. On the other hand, in attempting, either independently or in sympathy to conduct a boycott or strike against a common employer, the several organizations in the packinghouses have often come into conflict, and, at times, have seriously neutralized each other's efforts.

¹⁹ Glocker, T. W., *The Unit of Government in the Meat Cutters and Butcher Workmen's Union*, Johns Hopkins Economic Studies, June, 1905. See also *Official Journal Amalgamated Meat Cutters and Butcher Workmen of North America* (Aug., 1902), Vol. II, No. 33.

Local Unions and Councils

Many discordant elements of craft, sex, color, and race were harmonized and brought under the control of the International. The division was made primarily according to departments, of branches of the industry, and the unit of demarcation was the local union. The meat cutters were, wherever possible, gathered into separate locals. In the large packing centers, such as Chicago, Kansas City, or South Omaha, were to be found local unions of cattle butchers, hog butchers, oleo workers, and hide cellar men.

All the employees in a single department were gathered into one union, irrespective of skill. Thus the local union of cattle butchers include both the expert floorman and the unskilled penner. The Beef Luggers' Union includes also such common laborers as the cooler hands and the truckers. In the small towns, however, all meat cutters and butcher workmen were often united in one mixed union. It was usually found impracticable to organize women and men in the same local. At the same time, the women in many departments were not numerous enough to be separated on the basis of subdivision of the industry. Therefore, the women working in the packinghouses in Chicago or South Omaha, for example, were gathered into what was known as the Woman's Union. The Amalgamated Meat Cutters and Butcher Workmen of North America did not require or recognize, by distinct units of government, differences of race, color, or nationality. All women were admitted to membership, irrespective of race or color.²⁰ The difference of language sometimes presented difficulties, but these were largely overcome by the use of interpreters, and by printing all documents in several languages.

Harmony and unity of action between the several locals in one city was maintained by means of the Packing Trades Council, in which were usually represented not only the unions affiliated with the Amalgamated, but also locals of independent

²⁰ Abbott, Edith, and Breckinridge, S. P., "Women in Industry: The Chicago Stockyards," *Journal of Political Economy*, Oct., 1911.

auxiliary crafts employed in the packinghouses. The first packing trades council was organized in Chicago in August, 1901, in accordance with Section 4, Article IV, of the constitution of the union. Others were organized shortly in New York City, Kansas City, St. Louis, and San Francisco. At one time the the council in Chicago included all the local unions in the city connected with the meat industry, except the teamsters' union.²¹

Policy and Gains of the Amalgamated Union

The motto, or policy, of the union was expressed by the first secretary-treasurer, Homer D. Call, in these words: "To avoid strikes and settle differences with employers by arbitration."²²

The union did not desire to interfere in the management of the large packing companies, nor to overthrow the retail trade, but did propose to bring about reform in hours, wages, and conditions of work.²³

The main purpose in forming an international union was to get uniformity, as far as possible, in the wages and conditions of labor among cattle butchers in the different localities. Again, there was lack of uniformity to be remedied in the arrangement of the work in various packing centers.

Perhaps the greatest gain won by the union was the adoption of regular hours of work. Cattle reached the yards at night, and were bought by the packers early the next day. Seldom could they be driven over the chutes and delivered on the killing floors before 10 or 11 o'clock. Again, it was held that they could not be kept overnight and must all be killed on the day they arrived, since stockyard charges for holding overnight were 50 cents a head. Therefore, the men would report in the morning between 7 and 9 o'clock, as notified the night before. If the cattle were on hand they started work. If no cattle were there, a notice was posted to begin work at 10

²¹ Glocker, *op. cit.* See also Commons, J. R., *op. cit.*, p. 2, and for details of the Labor organizations, see Thompson, C. W., *op. cit.*

²² Official Journal, Vol. II, No. 35.

²³ Official Journal (Feb., 1902), Vol. II, No. 29.

or 12 o'clock, as the case might be. For the time spent in waiting the men received no pay, and often they would be required to work until late at night in order to dispose of the day's arrivals.

Two years after the union was organized it took up this matter, threatened a strike, and in conference with a packer, told him of the hardships of the men, in that they never knew beforehand when their work would begin or be done. The packer had not known of the conditions and abolished overtime, so that the men began at 7 o'clock regularly and left at 5:30 P. M. If after 10 hours of work there were cattle remaining, they were held until the next day.

System of Promotion Planned

In 1902 and 1903 the union, through its house committees, arranged a definite system of promotion for laborers.²⁴ Thus, a man who began work by raising gullets would become a foot skinner, and he in turn would become a leg breaker. The last-named man could be advanced to the position of a feld cutter. The next higher step would be the work of the rumper. Above this was the work of the floorman, and the ambition of most of the men was in the direction of this job.

A vacancy in any of the ranks would be filled by the oldest in the employ from the rank next below, provided the union did not have among its unemployed one who was a specialist in such work. The plan of promoting according to seniority in employment was rigidly followed by the unions, but if the man thus promoted could not fill the place, he would have to yield to the next in rank. No one was allowed to skip any of the grades of work, and to prevent this a system of transfer cards was established.

All in all, the unions had done a great deal for the workers. Especially, they had acted as a great Americanization force.²⁵ They had also tried to ameliorate the evils of casual

²⁴ Thompson, C. W., *op. cit.*, p. 103.

²⁵ See also Bulletin 56, U. S. Bureau of Labor.

work and the consequent undermining of family neighborhood life.²⁶ They were ably assisted by the University of Chicago Settlement and as a result public baths, playgrounds, and reading rooms were brought near the children of the stockyards workers. The second generation began to insist on a higher standard of living.

Early Strikes in the Packing Industry

It was clear that organization of the workers would bring clashes with management. Prior to 1904 there had been strikes in the packing industry, which were more or less successful. The first strike of any importance was about 1869. The next general one was in 1876. Then in 1886 came a demand for the 8-hour day which was sweeping over the United States. It resulted in the skilled workers securing the 8-hour day, but the winter of 1886 was a very severe and hard one for the industry, and the old hours were re-established. Several years intervened before the next strike which occurred in 1894 as a result of the great railroad strike of that year. In the stockyards it was a sympathetic and unorganized affair and it had lasted only a couple of weeks when it was declared off.²⁷

Note had already been made of the beginnings of the Amalgamated Meat Cutters and Butcher Workmen. In 1900 it reorganized in the various packing centers and began work in Chicago. From 1900 to 1904 Michael Donnelly was in charge of this organization, and he did a really remarkable work in bringing together all the workers into one great union. Between 1900 and 1904 each local union through its committees had made its own demands and agreements at different times, with the approval of the national organization. Demands of this kind had been made and granted in depart-

²⁶ McDowell, Mary E., "How Casual Work Undermines Family and Neighborhood Life," Proceedings of the National Conference of Charities and Correction, Buffalo, 1909, p. 150.

²⁷ John Fitzpatrick, President, Chicago Federation of Labor, in hearings before Federal Judge Samuel Alschuler (1918), p. 7. Judge Alschuler was arbitrator for the industry in labor matters for the period of the war.

ments where skilled workmen, such as cattle butchers and sheep butchers, prevailed, but had been rejected in other departments.²⁸ Most of these agreements were verbal, but wages and hours of labor were fixed annually by committees representing the packers and the men.

In May, 1904, the national union submitted to the employers a combined wage scale for all departments and classes of labor.

It was this scale that precipitated the strike; and the point of division was the demand for a minimum wage of twenty cents an hour, afterwards reduced to eighteen and one-half cents for all unskilled labor.²⁹

The packers offered to renew the contracts then expiring as they stood, but the labor leaders insisted on the increase for the unskilled workers. This the employers refused to give, on the ground that there had been no such increase in unskilled labor in any branch of industry in the United States, but instead a decrease.

The Strike of 1904

Several requests for arbitration were made by the union officials. These were at first ignored by the packers, but finally the packers themselves offered arbitration. The union leaders called the strike, nevertheless, some 16 hours after the packers had made the arbitration offer, though, it would seem, due to some misunderstanding of the offer of the packers. And this action seems to have been forced upon the union leaders by the attitude of the workers.³⁰ On July 10, in response to the strike order, all the workers of Swift and Company, Armour and Company, Schwarzschild and Sulzberger, Morris and Company, and the National Packing Company quit in Chicago, Kansas City, Omaha, St. Joseph, East St. Louis, St. Paul, and Sioux City. It was done in a very

²⁸ Commons, J. R., *op. cit.*, p. 3.

²⁹ *Ibid.*, p. 2.

³⁰ Official Journal, July, 1904.

orderly fashion. All work in progress was finished, and everything in the packinghouses was left in ship-shape order. The livestock handlers were willing to come out, but the union officials requested them to stay on and take care of the animals so that the livestock would not suffer.

The men were out for 8 days and went back when an agreement to arbitrate had been signed,³¹ but no sooner had they started work than they were again called out on the grounds of discrimination. This was the great mistake of Donnelly's career.³² The packers by the terms of the agreement were not bound to find places for all the old men at once. They were allowed 45 days in which to adjust their organization. But the strikers held they should be taken back in a body.³³ Most of the companies did not discriminate in re-employing men, for

³¹ The agreement was as follows:

"Memorandum of agreement entered into between the representatives of the various packing companies, whose signatures appear below, and representatives of the Amalgamated Meat Cutters and Butcher Workmen of North America as follows:

"Wages and working conditions of all employees now on strike to be submitted to arbitration, each party to this agreement having the privilege of bringing before the arbitrators for decision any question of wages or conditions, or any other grievances they may have, and both to abide by the decision of the arbitrators.

"The packing companies ignoring this agreement to retain all employees now at work, who wish to remain and to re-employ all employees now out as fast as possible without discrimination. Employees to return to work at the wages received when going out, pending the decision of the arbitrators. Arbitrators to consist of three practical packinghouse men, and to be selected as follows: one representative of the packing companies, one representative of the Amalgamated Meat Cutters and Butcher Workmen of North America, then these two to select a third member. The two first named shall meet within forty-eight hours after resumption of work, proceed to elect the third member, and shall meet daily for that purpose until this duty has been completed.

"When the third member has been selected, the three shall meet daily, unless adjournment be had by unanimous consent, until the final conclusion has been reached and the award made. Any former employees not re-employed within forty-five days from date work is resumed to have the privilege of submitting his or her case to arbitration on question of discrimination, decision of arbitrators to govern.

Committee on behalf of Packing Companies.

THOMAS J. CONNERS.
THOMAS E. WILSON.
EDWARD TILDEN.
C. & B. W. of N. A.
M. DONNELLY.
W. M. STERLING.
JOHN FLOERSCH.
THOMAS I. KIDD."

Committee on behalf of A. M.

³² The whole strike was ill-timed. For as the *Chicago Chronicle* summarized the matter (*The National Provisioner*, XXXI, p. 37, No. 12, Sept. 17, 1904):

1. It was useless to try to corner unskilled labor for the packers filled places with negroes from the South and other cities who did as good work.

2. It was foolish to strike for wages on a falling market. The time to strike is when there are large contracts and a big demand. It was folly when large interests were curtailing production.

3. It was too late to think of settling by force.

4. It was suicidal to strike when such action did not enlist public opinion in its favor.

³³ *The National Provisioner* (July 23, 1904), Vol. XXXI, No. 4, p. 13.

they were as anxious as the men to have work resumed, but it is clear that one or two leaders were not re-employed on their first appearance. Without investigation, Donnelly was forced by the radical element against his better judgment to renew the strike.

The real struggle then began. At the time of the first settlement the packers were ready to make concessions, but now they felt it must be a fight to the finish, unless they were prepared to turn over the entire management of their business to shop committees and business agents. If the unions had won, they would have made all kinds of rules and the old ones were irritating enough. Therefore, the packers never deviated one inch from the position that they had taken to whip the unions until they were in a position where the packers need make no agreement with them whatever.

The workers had acted in violation of the agreement just made, which bound them to submit discriminations and all other grievances to arbitration, but the mistake was a natural one. It followed a history of grievances on both sides, and a conviction on the part of the workmen that the packers were determined to destroy their union.

End of the Strike

The strike was finally called off on September 9, 1904, after the men realized that the packers would not meet them in conference. The final outcome, therefore, was in favor of the employers.

Regarding this strike "perhaps the fact of greatest social significance is that the strike of 1904 was not merely a strike of skilled labor for the unskilled, but was a strike of Americanized Irish, Germans, and Bohemians in behalf of Slovaks, Poles, Lithuanians and negroes." Again, in the conduct of the strike each side might have taken more advantage of the other than was actually the case. The ridiculous way in which the strike was handled by the press to exaggerate the fact was

well dwelt upon by Dr. Graham Taylor who showed the unreliability of press reports.

The strike of 1904 was beaten, first, because the employers had their branch house organization to call upon in replacing skilled workers. Indeed, the division of labor had gone so far in the industry that it made the skilled workers no more indispensable than the unskilled; e. g., cattle butchers, who were thought to be the aristocrats of the trade, were the easiest men to replace. The second reason, following closely on the first, was that the technique of the industry allowed the use of hordes of unskilled negroes and non-English-speaking laborers offering themselves at the gates.

CHAPTER XXXII

HUMANIZING THE PACKING INDUSTRY— 1904-1922

Period of Constructive Progress

The second period in the history of labor in the packing industry began in 1904 after the strike of that year. It has been a period of great progress in the well-being of the packinghouse workers who number throughout the country from 160,000 to 200,000 strong. The first period was a time of pioneer agitation on the part of workers to bring home to the employers in an industry of astonishingly rapid growth, the necessity of change in working conditions. By 1904 the workers had impressed this need upon the packers, but what is of more importance is the fact that, by that year the industry had developed its organization to a point of perfection where the men at the head of its affairs could turn their attention from a mad rush for rapid production and the meeting of new market demands, both national and international, to the internal industrial relations of the business. At first the change came slowly because of the aftermath of the strike, the unfortunate feeling on the part of the workers against the employers and the difficulty of getting the employees to realize that their welfare could be furthered better by co-operation between packers and workers, than by opposition between packers and a union, which, although it had done good pioneer work, lacked sufficiently intelligent leadership and membership to erect a stable structure of industrial relations on the early foundation work.

In a short interim period things were not, of course, satisfactory. After the strike the old rule of seniority in promotion, established by the union, disappeared and promotion

became unorganized, the men competing among themselves for the favor of a foreman. There was a feeling of insecurity, since one might be displaced by a foreman's favorite after a forced week's schooling. The employers before 1904 had made agreements with unskilled workmen's unions. After that date they refused to recognize such unions, which were therefore severely crippled. In 1907 the membership of the Butchers' Union was only half what it had been in 1904. This was in most places a union made up of skilled workmen. About the only two organizations which kept going were the Teamsters' Union and Hair Spinners' Union, the latter made up of workers who handled a very intricate and skilled operation. The Amalgamated Meat Cutters and Butcher Workmen also continued to keep a small local union alive.

Packers Better Working Conditions

However, the fact that the packers, especially in Chicago, did not recognize the unions after 1904, did not mean that the welfare of the workers was neglected. On the contrary, the lesson of the strike had been learned, and where steps had been taken before 1904 to make working conditions better, the strike gave an impetus to go further in improving the workmen's lot. Where little or nothing had been done, the strike showed the necessity for some action. In both cases, therefore, a great deal of constructive work was accomplished in the larger packing concerns during the years from 1904 to 1914 to better the working conditions.

This work was done with the idea of making jobs more steady, raising the standard of the foremen, increasing wages, and giving a chance to the worker to rise on his merits. For the attitude of the packers was that with large bodies of workers, for the most part unskilled, these were the four things the average worker wanted. It was felt that he was little interested in profit-sharing or management-sharing, or any kind of a stake in the business that involved responsibility.

To increase the interest of the workers in the future of

the business, Swift and Company, as early as 1900, had thought it best to start an employees' stock investment plan. By this plan workers were able to buy shares of the company's stock at the market price by the payment of 10 per cent cash, the balance being spread over a period of two years. Since the employee received dividends of 8 per cent on the par value of the shares, while he paid only 5 per cent interest on the unpaid balance, the dividends carried more than the interest charges.

About the beginning of the century, lunchrooms for the workers were provided by the larger packers, and these were made more attractive after 1904. Cafeterias were installed for office and plant employees in some of the packing plants. This service enabled the employees to get hot meals at cost, without leaving the plant. Restrooms were at an early date provided for the women workers, and these have increased in size and completeness with the increase in the number of women employed in the industry. In many plants of Chicago packers and some others throughout the country there is now a welfare building and a gymnasium, library, and a school for office boys.

Medical Departments and Safety Plans

During the pioneer days very little care was given to employees injured while at work, or who were unable to work because of illness, and while some companies claim to have had medical departments ever since the plants were established, the fact is that these have been built up to their present size and efficiency only since 1904. At present in the larger plants there are medical departments with staffs of physicians, surgeons and nurses, and emergency hospitals. The dispensary is made up of a reception room and office, men's treatment room, women's treatment room, men's restroom, women's restroom, and the examining room. In addition, ambulance service is provided by the company. In some cases a field of work called "reference service" has been developed that has been of great use. An employee who is in need of a specialist for himself or his family may be referred to the proper person through the

employees' medical department. In a few instances free dental work is also performed for the workers.

As a business proposition, many packers early realized the necessity for safeguarding the workers by educating them in self-protection against injuries and illness, as well as in providing a system of safety-first devices and by the use of bulletin boards, pictures, and printed notices. With this there has developed regular inspection of plants, safety meetings, and accident prevention rule books. In this way, among the more progressive packers, the number of accidents has been cut in half, and a great deal of money saved both to workers and the companies.

It was realized, however, that the safety-first work was not solving entirely the problem of the employees' risk from loss of health and accident. To eliminate from the workers' minds the uncertainties of these misfortunes, some companies have gone further, notably Swift and Company. In July, 1907, this concern established a purely voluntary employees' benefit association, whereby all employees might become members of the association, through contribution to the benefit association fund. From this fund, payments of definite sums are made to the members, according to a carefully calculated schedule, "when they are entitled to such payment by reason of disability, or, in the event of their death, to the relatives or other beneficiaries designated."

Benefit Association and Pensions

The benefit fund administered by trustees and a manager consists of contributions from members in the association, income from investments, and money advanced by the company, when necessary to pay benefits as they become due. The operating expenses are borne entirely by the company. Contributions by members are made weekly or fortnightly, and the amount depends upon the wage or salary. The benefits received are classed as accident, sick, lump sum, and death. Payment in case of accident or sickness is for a period of 104

weeks, with an allowance for medical and surgical treatment in the case of accident.

The extent of the good done by the association is indicated by the disbursements. From its inception to January 1, 1922, there had been paid out in the 33,326 cases of sickness, \$864,-461.09; in the 66,410 cases of accident, industrial and off the plant, \$1,044,409.92; in the 2,084 death cases, benefits of \$1,000,000. The employees show their appreciation of its importance, for there are now 30,000 members, or 75 per cent of the employees, availing themselves of the benefits of the fund.

To supplement further the income of employees from the Compensation Law, the Employees' Benefit Association, or other sources in sickness, this company for some years has pursued the following plan:

Steady-time employees in the offices and plants, who have been employed for one year or less, in case of sickness are carried on the pay-roll for one day for each consecutive month in service up to 12 days' maximum within the previous 12 months. In cases of sickness for a longer duration of time, application for further payment on account of continued absence may be made, and where service merits, the request will be granted. Provision is made for those who have been employed over one year. Hourly plant employees who have been in the service of the company for two years are paid one-quarter pay in case of sickness after the first full week for a maximum period of 3 months within any one period of 12 months. In case of accident any employee is paid for the first week of disability in order to supplement the payments under the Employees' Compensation Law. These payments are independent of the Employees' Benefit Association benefits. The arrangement is voluntary on the part of the company, and therefore subject to change as circumstances may demand.

Pension systems were inaugurated by some of the larger companies at a later date. Morris and Company started one in 1909, with the Morris pension fund. Other companies fol-

lowed their example. As showing a simple system, Armour and Company's plan can be cited. Under this system every salaried employee of Armour and Company, except married women and boys under 16, is eligible to participate in the benefits of the Armour pension fund. The system under which this fund is administered is based upon an endowment of \$1,000,000 appropriated by the company and is co-operative. Each employee receiving from \$520 to \$7,500 a year in salary, contributes 3 per cent of his salary. Upon the completion of 20 years of continuous service, officers and employees are eligible to pension at 57 years of age for men, and 50 years for women. The compulsory retirement age is 65 years. Pensions are computed at 2 per cent of the salary at retirement, multiplied by the number of years of continuous service. Refunds are provided for employees leaving the service. For plant employees ineligible to pension, this company maintains a service roll in the benefits of which some 70 employees, with terms of service ranging from 18 to 45 years, are now sharing.

"Guaranteed Time" for Workers' Benefit

One of the great needs aside from the improvements of physical working conditions in the industry was more steadiness as to hours in the individual job. This problem was recognized for a long time by the packers, and finally in 1912 one of them, Swift and Company, led the way by putting into effect in the larger packing plants of the company what is known as "guaranteed time," which was set at 40 hours per week. In January, 1916, this minimum wage standard of 40 hours was raised to 45 hours, regardless of whether that number of hours had been worked or not, and this continued until 1918, when the number was shortened to 40 hours again to accord with the reduced standard week of 48 hours. The packers are said to be the only large employers of labor in the country who maintain this system of guaranteed time.

This working time is guaranteed weekly to the workers and is not on a daily basis, as the conditions of the industry make

it impossible, for example, to place the industry on an actual 8-hour day. Recently this was recognized when it was allowed that on 3 days there might be some extra time necessary to complete the plant operations.¹

The reasons for not being able to have an actual 8-hour day are: In the first place the employers have no means of determining or controlling the amount of livestock receipts in any day. The necessities of the livestock producer are such that when he sends his livestock to market it must be purchased, and he must receive his cash therefor. If it were otherwise, and the livestock grower were not sure of having a market where he could convert his livestock into money, he would soon refuse to produce livestock.

In the second place there must be no delay in slaughtering after the livestock is purchased; otherwise, there would be a tremendous loss, due to the unavoidable shrinkage and the cost of feed and care. In the third place, from the time the livestock is slaughtered there must be no cessation or interruption in the succeeding operations until the finished product is placed in the cooling room, as obviously the entire product would spoil and be worthless. In the fourth place, men are required each day to take care of perishable by-products and do other work that cannot be completed during actual killing operations.

Different Conditions from Non-Perishable Products

It will be readily seen, therefore, that the packer finds himself in the position of being compelled to buy, slaughter, and manufacture to completion with practically no opportunity to control the working conditions so far as hours are concerned from day to day. Because of these conditions and the perishable nature of the product, the industry cannot be conducted in the same manner as can plants engaged in the

¹"Application for change in wage rates and working conditions in packinghouses operated under an agreement with the President's Mediation Commission and the Secretary of Labor," submitted June 6, 1921, to Federal Judge Samuel Alschuler, Administrator, Chicago.

manufacture and preparation of non-perishable products, where tools can be laid down at a certain hour each day and the work begun on the following day, where it was left off on the day before.

Rather, should it be compared to the work of the farmer, whose crops mature at a certain season each year, and who is compelled by the elements and climatic conditions to harvest his grain when ripe, to avoid the possibility of having it ruined. No one would contend that if a farmer anticipated a violent rain storm, he should not gather in his hay to save it from the effects of the storm merely because it would make him and his farm hands work more than 8 hours on the particular day.

Those familiar with the actual conditions obtaining during the various days of the week and the various seasons of the year know that the heaviest receipts occur during the early part of the week, and it frequently happens that there are days during the latter part of the week when it is impossible to give the men 8 hours' work. The separate gangs must be kept and organized in such numbers as to take care of the normal average receipts and must be maintained and retained on days when a minimum quantity of receipts arrive. The size of these gangs cannot be varied from day to day. In this respect again, this industry differs from a mine or factory, where when the working hours are lengthened, a proportionate decrease in the force can be brought about without decreasing the amount of product manufactured.

It is for this reason that the employers put into effect the so-called 40-hour guarantee.

Advantage Both to Industry and Labor

Experience has shown that it would be better for the regular workman, year in and year out, to have a fair guaranteed time than to receive a penalty for overtime, which could not produce as much money for himself and his family as he would receive under a new adjustment in working conditions, and would not interfere to any considerable extent with his

opportunities to spend a desirable amount of time at home or otherwise, as he pleased.

The 40-hour week guarantee was installed at a time when it represented practically two-thirds of the average weekly hours worked. Experience has shown that it is better and preferable for the worker to receive a guaranteed time somewhere approximating the percentage suggested, based on the average hours per week that may be worked before the employer is penalized by being required to pay for time not represented by work performed.

The packinghouse workers want guaranteed time because it gives them an assurance of income not enjoyed anywhere else. It is beneficial to the industry because it results in making the workmen better satisfied, since so long as they are on the pay-roll and desire to work they cannot receive less than the guaranteed time for any week's pay. The present guarantee of pay is equal to 5 days of 8 hours each week, even though the business of the employer would only necessitate 4 days or less work in the week.

With the outbreak of the European war in 1914, industrial conditions changed, the cost of living advanced, and there was a labor shortage. The packers realized that workers should receive higher wages, and beginning with 1916 the common labor rate was increased. Between 1914, which is taken as a base at 100, and 1921, hourly wage rates were advanced to 306.9 per cent, and the average daily wages went up to 245.1 per cent. On the other hand, the cost of living, according to the National Industrial Conference Board, increased to 185.3 per cent, which is an indication of increased well-being for the workers. Moreover, in addition to these money increases in well-being, there were others made which are of great constructive importance.

Industrial Relations Departments

In 1917 several of the larger packers as, for example, Swift and Company, Wilson and Company, Armour and Com-

pany, and the Jacob Dold Packing Company, established, although not all were called so, industrial relations departments to systematize and correlate all the agencies for developing the well-being of the workers and increase the service of the companies in looking after the interests of labor. The old personal contact between employers and employees, it was realized, had become impossible to maintain, and it was necessary to substitute something to take its place in the packing industry, as other large-scale enterprises had done. The thought, in a word, was to humanize the packing business.

In establishing industrial relations departments, these purposes were kept in mind:

1. The intelligent fitting of the prospective employee to the job for which his physical, mental, and vocational qualifications best suit him.
2. To care for his physical well-being, health, safety, and comfort during the period of his employment, and to assist him in making provision for his future.
3. To foster and create proper facilities and opportunities for mental and social development, rest, recreation, and play.²

To enter upon a detailed description of the functions of these departments of industrial relations would take too much space here, but reference to Figure 35 will show the organization of the industrial relations department of Swift and Company, whose first manager is John Calder. Under the five divisions of employment, medical, training, conditions, and social service, practically all the phases of the relations of the worker arising out of his employment are provided for. The department is charged with the framing and carrying out of the company's policies in these matters, and in doing so it deals with 35,000 employees in plants and some 15,000 employees in offices, branch houses, and sales work.

² Ellerd, H. G., "Labor Problems in Packing Plants," an address read at the Convention of the Institute of American Meat Packers, September, 1920. Mr. Ellerd is chairman of the industrial relations committee of the Institute, and manager of the industrial relations department of Armour and Company. See also Adams, Kate J., *Humanizing a Great Industry*.

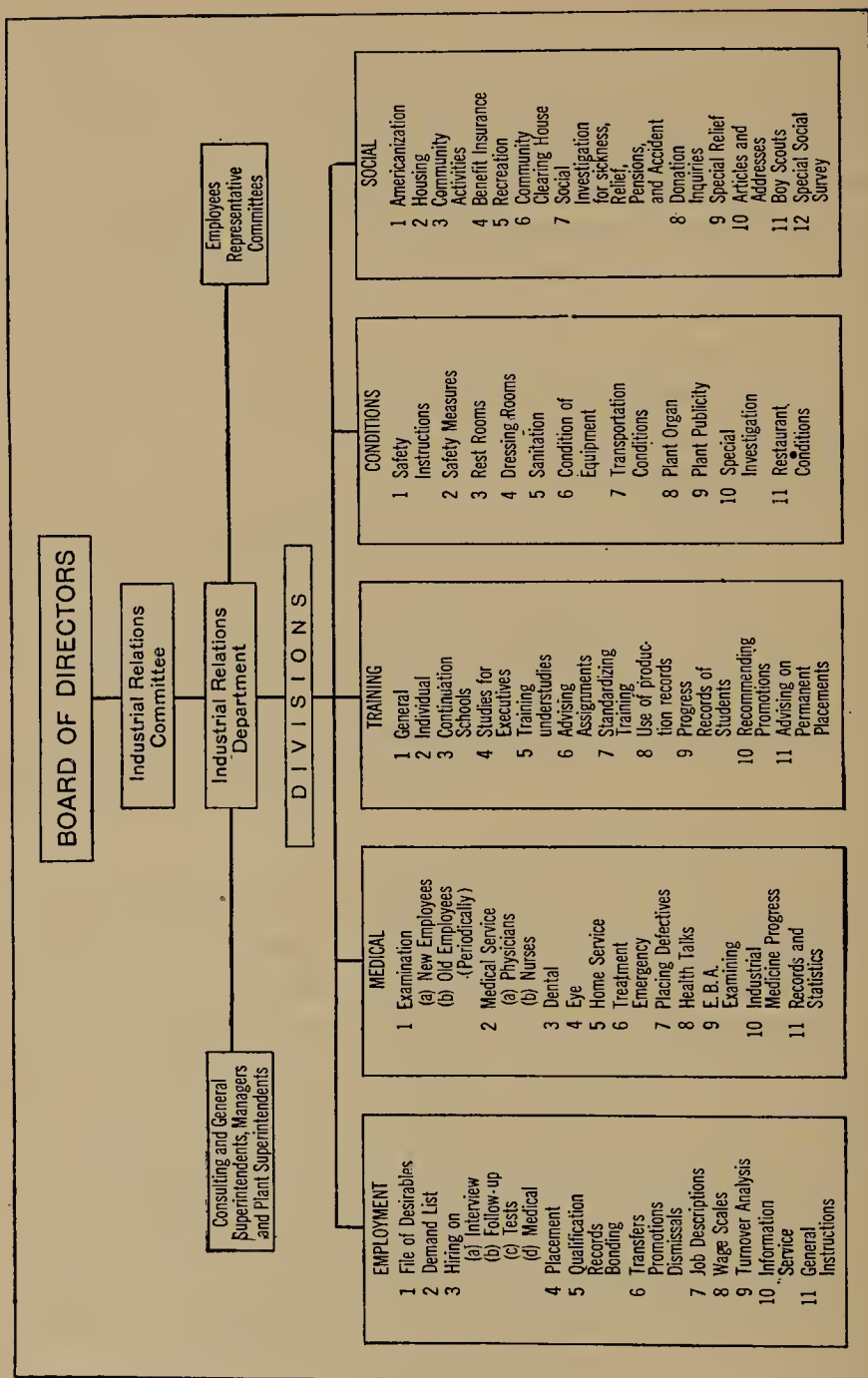


Figure 35. Organization Chart of Industrial Relations Department, Swift and Company

This was the situation as regards labor in the packing industry when the United States was drawn into the World War. The unions had been of very little consequence for years, especially since many of the reforms in working conditions had been carried out by the packers in a constructive way. The well-being of the workers had been greatly improved.

Labor Problems in the Great War

A new situation arose with the outbreak of the war. On the one hand there was an unprecedented demand for labor, much of it of the type used in the packing industry, to hasten necessary production in carrying on a war. At the same time 3,000,000 men were withdrawn from the active participation in industry in the United States in order to raise an army. Since labor had to be obtained, and imperatively so for such basic industries in warfare as that of meat, the history of labor problems in the packing industry took on a new phase.

First, this new condition in the industry made it possible for labor organization to reassert itself, as it did everywhere, and to present demands which, while in the beginning valid, led to unreasonable requests and threats. It was to be expected, therefore, that the leaders of the unions in the packing industry would take advantage of the opportunity afforded them, and as a result of co-operation among various bodies there was organized the Stockyards Labor Council under the Chicago Federation of Labor, which set to work to unionize the packinghouse employees.³

In November, 1917, a conference of the representatives of the international unions involved was held in Omaha and later in Chicago, at which were discussed the advisability of presenting certain demands to the leading packers. The result was a draft of an agreement specifying these demands which the large packers were to be asked to sign. Attempts were made

³ It consisted of the A. M. C. & B. W., the engineers, firemen, machinists, blacksmiths, electrical workers, car men, coopers, steam-fitters, etc.

to do this, but in consistent keeping with their long-standing policy, the packers refused to deal with the labor leaders.

Following on this refusal the Stockyards Labor Council met and ordered a strike vote which was in favor of action, in spite of the fact that the war was on and the packing industry had to be kept going to supply the American and allied forces. At this junction the American Federation of Labor was notified. Shortly after the strike vote was ordered, a representative of the federal government conferred with the labor leaders in Chicago. The latter were asked not to put into effect the strike vote until a government investigation was held. The labor representatives demanded a conference, which the packers declined, not wishing to recognize the union.

President's Mediation Commission Report

Indeed the matter was so serious, because the Allies were in large measure dependent on the meat packing industry for supplies, that the President's Mediation Commission investigating labor troubles throughout the United States came to Chicago and heard evidence on the packing industry dispute.

As a result this Commission reported as follows:

1. In December a strike radiating from Chicago threatened the meat packing industry. The issues affected upward of a hundred thousand men. Even more important, the continued meat supply to the Allies was involved. The commission was requested to intervene to avert the danger.

2. As is generally true of large industrial conflicts, the roots of the labor difficulty in the packing industry lie deep. The chief source of trouble comes from lack of solidarity and want of power on the part of the workers to secure redress of grievances because of the systematic opposition on the part of the packers against the organization of workers. The strike of 1904 destroyed the union, and for fourteen years the organization of the yards has been successfully resisted. In 1917 effective organization again made itself felt, so that by the end of the year a sizable minority, variously estimated from 25 to 50 per cent, was unionized. It is a commonplace of trade union experience that an organized

compact minority can control the labor situation in an industry. The union leaders felt, and rightly felt, therefore, that their demands had the effective backing of a potential strike. More important than any of the specific grievances, however, was the natural desire to assert the power of the union by asking the packers for union recognition, at least to the extent of a meeting between the packers and the representatives of the unions.

3. This the packers refused to do. They refused to meet eye to eye with the union leaders because of the distrust of those leaders. It can not be gainsaid that the absence of a union organization for 14 years, the increasingly large per cent of the non-English speaking labor, and the long pent-up feeling of bitterness all tended to make some of the men in whom the leadership for the time being rested somewhat devoid of that moderation in thought and speech, which come from long experience in trade negotiations. On the other hand, refusal of the packers to deal with those leaders tended to encourage and intensify those very qualities which dissuaded the packers from industrial contact with them.

4. The two important specific grievances involved low wages and long hours. In fact, two wage increases had, during 1917, been granted to workmen, largely in an endeavor to forestall union activity. Nevertheless, the claim was made, and validly made, that the wage scales, particularly for the great body of unskilled workers, were inadequate in view of the increased cost of living. A further fact that influenced the workers in their wage demand was the belief that the companies had been making excessive profits, despite Government regulation of prices. Unfortunately, the refusal of the packers to meet the union leaders deprived the packers of the opportunity of explaining away, if possible, the belief entertained by the men that the packers were profiteering.

5. A demand for the eight-hour day in place of the present ten-hour day had all the momentum furnished by the nation-wide movement in the direction of the eight-hour day. The companies, in fact, conceded the principle of the eight-hour day. They had been studying the practicability of themselves introducing a change, which they realized is inevitable for American industry. They claimed to be obstructed in its adoption by reason of difficulties attending both in-bound and out-bound shipments. These conditions depend for correction upon action both by the Government and by the industry. The study of the entire matter by the Government is urgent, so that any inter-

ferences to this needed measure of social policy may be removed as promptly as possible.

6. The commission's settlement proceeded along the general lines it had taken in other industries:

(a) The principle of adjustment through negotiation and arbitration was established to take the place of strike and lockout during the period of the war.

(b) Prohibition of discrimination for union affiliation is rendered effective by its enforcement through administrative machinery. It is not sufficient to recognize in the abstract the right of workmen to organize. Therefore, effective means were provided to secure to the union the right to live and to grow.

(c) The unfairness of compelling workmen to deal individually with employers of large scale industries, particularly emphasized in the case of non-English speaking workmen, is recognized in practice by allowing workmen to voice their claims through representatives.

(d) The specific demand of the workers as to changes in hours, wages, and conditions of employment were all left for determination by the United States administrator.

7. Here, as elsewhere, a tense situation threatening a breakdown of a vital war industry was relieved by establishing machinery for adjustment. Under this machinery the parties are now proceeding to work out their difficulties. The hope is entertained that not only will specific grievances be justly dealt with, but healthier permanent relationships will be created in the very process of seeking to reach adjustments.

After conference of the labor leaders with President Wilson, the matter was turned over to the Secretary of Labor, who arranged a joint meeting in Washington between the packers and the labor leaders.

Federal Administrator for Labor Problems

A curious feature of this was that each party signed an agreement, not with the other party to the dispute, but with the President's Mediation Commission and the Secretary of Labor.⁴ By this agreement all matters of dispute were to be

⁴ The agreement read as follows:

"THIS AGREEMENT, made and entered into this 25th day of December, 1917, between Armour & Company, The Cudahy Packing Company, Morris & Company, Swift & Company, and Wilson & Company, their successors and assigns (together with

brought before a federal administrator for decision. Thus both sides to the dispute agreed to constitute this labor administration of the industry so that there might be no "interruption, cessation or curtailment in the successful prosecution of the war and the military activities of the government."

Federal Judge Alschuler, who had been appointed administrator, rendered his first award on March 30, 1918, in which he decreed a basic 8-hour day, overtime rates, certain wage increases, and definite guaranteed time. In so doing he met most of the demands of the workers. From time to time as he was called upon to make awards, which were published, the wages of the workers were increased, in the case of common labor, from 32 cents an hour in January, 1918, to 55.65 cents in July, 1920. This total increase under the Alschuler administration brought the wages of common labor to a level of 218 per cent above that of 1914, which was, as has been

any company or companies controlled by them or any of them) hereinafter referred to as the companies, the parties of the first part, and the *President's Mediation Commission*, the party of the second part.

"Now, THEREFORE, the respective parties do hereby mutually covenant and agree as follows:

ARTICLE I.

"The companies agree:

"(1) That no employe will be discharged or discriminated against in his or her work because he or she does not belong to a trade union. No collecting, soliciting, or advocating for or against unionism shall be permitted on the premises.

"(2) That all piece work schedules shall be exhibited at each of the plants with reasonable access thereto on the part of all employes affected thereby.

ARTICLE II.

"The President's Mediation Commission agrees to use every effort to bring the full performance, not only of the letter, but also of the spirit of this agreement by all the parties thereto, so that strikes or lockouts will not occur during the period of war.

ARTICLE III.

"It is further agreed by all parties hereto:

"(1) That there shall be no strike or lockout during the period of the war.

(2)

"(3) That all grievances and disputes on the part of the employes of the companies shall be taken up with the foreman or other immediate superiors of the affected employe or employes, and then, if they cannot be so adjusted, with the superior officers of the company in regular order until the matter shall have been submitted to the general manager, if not adjusted by some one of his subordinate officers. If any grievance or dispute cannot be thus adjusted, it shall be submitted to the United States Administrator for arbitration by him, and his decision shall be binding upon all parties thereto. Grievances and disputes may be submitted to any of the officers of the companies, and to the United States Administrator, by any employe or employes, either in person or through their representatives; such representatives, however, to represent and act solely and only for such employe or employes, and for no other person, committee or association whatsoever.

"(4) That this agreement shall apply to the companies' plants in—

Chicago, Ill.	Sioux City, Iowa	St. Joseph, Mo.
Denver, Colo.	Kansas City, Kansas	St. Louis, Mo.
East St. Louis, Ill.	Oklahoma City, Okla.	Omaha, Neb.
St. Paul, Minn.	Fort Worth, Texas.	

"(5) That this agreement shall continue in effect, and the parties hereto, for themselves, their successors and their assigns, expressly agree to be bound hereby, during the continuation of the war.

noted, much higher than the increase in the cost of living.

In 1921, however, the packing industry passed through what was called by J. Ogden Armour the most disastrous year in the history of the industry from the financial point of view. It was necessary to cut inventories by millions of dollars. Business depression injured the sales of packinghouse products, and prices had to be reduced to a level where they could be moved. This meant, in the case of one packer, a loss for the year 1921 of some \$30,000,000 and in the case of another of \$8,000,000. Meanwhile, living costs had decreased from the peak of 204.5 per cent in 1920, to 165.7 per cent at the end of the first quarter of 1921.

Readjustment after War Period

That the industry was going to require some readjustment as to operating expenses was clear by February, 1921. Of the total expense, that of labor constituted about 46 per cent, or over one-tenth more than in 1915. It was felt, therefore, that wages must be reduced to some extent, and on February 21, 1921, two and one-half years after the signing of the armistice and the cessation of war, the packers, believing that the object for which the agreement was established had ceased to exist, and that a wartime emergency measure was no longer in effect, notified the Secretary of Labor of their view as to the termination of the administration. They also announced a general wage reduction of 8 cents per hour, effective March 14, 1921, which gave to common labor a rate of 45 cents per hour. Upon protest of the employees and upon conference with the Secretary of Labor, an agreement was again reached, confirming the 8 cent reduction as made, but leaving all other matters to the administrator, whose functions were continued until September 15, 1921.⁵

⁵ In July, 1921, the packers requested a further wage cut of 5 cents in a brief presented to Judge Alschuler. He denied the request because in his judgment the cost of living had not declined for the small consumer as had been contended.

The effect of this 8-cent reduction on all wages left the hourly rates showing an increase still of 257.1 per cent, or 157.1 per cent over 1914. The effect on the daily wage was to leave it at an increase of 205.7 per cent, or 105.7 per cent over 1914, while the cost of living in March was, as has been stated, 165.7 per cent, or 65.7 per cent over 1914. The following table shows the rates and per cent increase, for common labor, both hourly and daily, paid by Swift and Company since December, 1914:

WAGES, SWIFT & COMPANY, CHICAGO
COMMON LABOR

		Hourly		Daily	
		Rate	Per Cent Increase	Rate ¹	Per Cent Increase
1914	December.....	17.5	.0	1.75	.0
1915	December.....	17.5	.0	1.75	.0
1915	February 28.....	18.5	5.7	1.85	5.7
	April 29.....	20.0	14.3	2.00	14.3
	October 2.....	22.5	28.6	2.25	28.8
1917	April 1.....	25.0	42.9	2.50	42.9
	September 3.....	27.5	57.1	2.75	57.1
1918	January 4.....	32.0	82.9	3.20	82.9
	May 5.....	40.0	128.5	3.20	82.9
	November 10.....	44.0	151.4	3.52	101.0
1919	February 15.....	46.66	188.6	3.73	113.1
	September 1.....	49.79	184.5	3.98	127.4
1920	April 5.....	53.00	202.9	4.24	142.3
1920	July 5 ²	55.65	218.0	4.45	154.3
	December 5.....	53.00	202.9	4.24	142.3
	March 14.....	45.00	157.0	3.60	105.7
1921	November 28.....	37.50	114.3	3.00	71.4

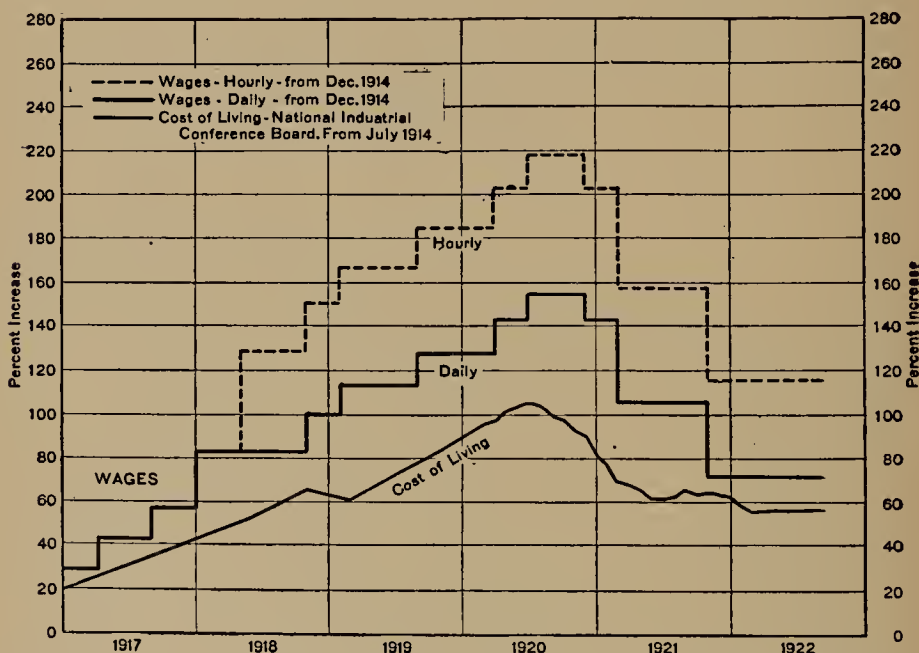
¹ Daily rate figured on a 10-hour basis to May 5, 1918, and 8 hours thereafter.

² Bonus of 5 cents from July to December given by Judge Alschuler.

NOTE: The average wage for common labor from 1904 to 1916 was about \$1.50 to \$1.75 for a day of 10 hours.

Plans of Employee Representation

At the same time that the wage question was being discussed, and extension of the Alschuler administration was agreed upon with the Secretary of Labor, there was pointed out to the Secretary by the packers that a new step of great importance was contemplated by them in the development of industrial relations in the industry. This was the establishment of plans of employee representation. The Secretary felt that the



Courtesy Commercial Research Department, Swift and Company.

Figure 36. Chart Showing Comparison of Wages in the Packing Industry with Cost of Living in the United States

continuation of the Alschuler administration for an additional 6 months would not occasion any embarrassment to the packers, but would give ample opportunity for getting these plans started and the employees acquainted with the plans of employee representation. The government encouraged the larger packers in thus setting up in their plants representative assemblies to consider the employees' interests and possessed of legislative powers. The companies have published these plans.

The thought back of this movement in industrial relations was the same as that which had influenced other large corporations in establishing industrial democracy. It was realized that an efficient and harmonious labor force is not necessarily obtained when the employer is satisfied that it has been justly handled. The employees must feel that justice has been done and that fair treatment has been received. This feeling depends not only upon the actual details of the treatment, but also upon the extent to which the employee himself has participated in arranging these details.⁶

While a forerunner of the plan of employee representation had been worked out by Wilson and Company in its committees on progress, and while employees' representation had been installed in 1918 at Jersey City, New Jersey, and in 1919 at Toronto and Winnipeg, Canada, which were not under the temporary administrator, by Swift and Company as experiments, Armour and Company was the first of the companies by a month or so, to establish an employees' representation plan covering the whole company organization. On March 15, 1921, the first election was held in the Chicago plant, at which time the employees elected representatives to meet with representatives of the management in the consideration of all matters of mutual interest, with the exception that such representatives should have no jurisdiction over wages and working conditions until after the expiration of Judge Alschuler's term, which had been extended until September 15. The great majority accepted the proposal and voted for representatives.

This group in Chicago met and drafted the first constitution, which was a tentative working plan of employee representation. This constitution was prepared in joint session between the representatives of the employees and representatives of the management and they were agreed upon it in

⁶ Calder, John, *Personnel Problems of Swift & Company, Commerce and Administration*, February, 1922, University of Chicago Press. Mr. Calder is manager of industrial relations in Swift and Company.

every particular. The plans of employee representation were read and discussed and the best provisions of these plans were written into the constitution. On April 21, 1921, this tentative plan was submitted to the employees of the Armour plants in nine other cities, and they were asked to elect representatives under this plan. In the elections about 90 per cent of the employees voted.

On August 3, 4, and 5, 1921, the first General Conference Board met at Chicago and revised and ratified the constitution for all the plants, giving such plants a voice in doing so. There were then some 16,000 employees working in plants having this plan and they were represented by 162 of their own elected delegates. This meeting was made up of 19 employees and 19 management representatives from the 10 larger plants of Armour and Company. These representatives debated for three days and as a result each provision was adopted unanimously. Employee representatives were chosen from those who had been elected at the general elections, and management representatives were shortly appointed. With that, the mechanism of the plan was complete.

The Plan of Armour and Company

As the principles of the Armour plan are representative of those of other companies, Sections 1 and 2 stand as the best possible explanation of the system. They are as follows:⁷

PRINCIPLES OF PLAN

1. In order to give the employees of the company a voice in regard to the conditions under which they labor, and to provide an orderly and expeditious procedure for the prevention and adjustment of any future differences, and to aid in the development of all matters of mutual benefit to the employees of the company, the following method of representation of employees has been agreed upon by representatives of the employees and the management.

2. This plan provides that the employees and the management shall have equal representation in the consideration of all questions of policy.

⁷ From "Employees' Representation Plan," Armour and Company.

PLAN OF ORGANIZATION

1. There shall be organized, at each plant where the size and local conditions of the plant warrant it,—

- (a) Divisional Committees and
- (b) Plant Conference Board

The Divisional Committees and the Conference Board shall be comprised of equal numbers of representatives of employees and representatives of the management. The employee representatives shall be elected by the employees. The management representatives shall be appointed by the management. Both shall, at all times, have equal voice and voting power in the consideration of matters coming before them.

2. Where conditions permit, each plant should be divided into divisions, which in general, shall be as follows:

(a) Beef Division: Which shall include all departments related directly or indirectly to beef, or which by reason of their geographical location in the plant can be most conveniently assigned to this division.

(b) Pork Division: Which shall include all departments related directly or indirectly to pork, or which by reason of their geographical location in the plant can be most conveniently assigned to this division.

(c) Production Division: Which shall include departments having to do with manufacturing, processing or the production of manufactured products, also such other departments which by reason of their geographical location in the plant can be most conveniently assigned to this division.

(d) Mechanical Division: Shall include those mechanical tradesmen necessary for the maintenance of the machinery, equipment and plant, also motive power men and such mechanical manufacturing as is done in the plant, such as box making, coopering, can making, etc.

3. For convenience in holding elections and to secure broad representation of all employees, the above divisions shall be divided into voting precincts. From these voting precincts, employees shall elect representatives to serve on the Divisional Committees and also on the Plant Conference Board. These precincts may be adjusted or changed from time to time, to secure fair and complete representation.

4. The Divisional Committees shall comprise representatives of the employees within the division and an equal number of representatives of the management.

5. The Plant Conference Board shall comprise representatives of the plant as a whole, and an equal number of representatives of the management.

6. Representation of employees shall be on the following basis:

- (a) In plants having 650 employees or less—one representative to

each 100 employees, or major fraction thereof. In plants of this size, the employee members of the Plant Conference Board shall comprise all the employee members of the Divisional Committees.

(b) In plants having more than 650 employees, but less than 3,000—one representative to each 200 employees or major fraction thereof.

In plants of this size, the employee members of the Plant Conference Board shall be elected under the same conditions and at the same time as the employee members of the Divisional Committees.

There shall be two employee representatives elected to the Plant Conference Board from each of the divisions.

(c) In plants having over 3,000 employees—one representative to each 300 employees, or major fraction thereof.

In plants of this size, the employee members of the Plant Conference Board shall be elected under the same conditions and at the same time as the employee members of the Divisional Committees. There shall be three employee representatives elected to the Plant Conference Board from each of the Divisions.

Representative Qualification and Election

The qualifications of employee representatives provide that only hourly paid employees, who are citizens and over 21 years of age and in the employ of the company one year, are eligible. This excludes steady-time employees, including foreman, assistant foremen, clerks, timekeepers, and others having the power of supervision of employment or discharge. The nomination and election of employee representation is by secret ballot and all may vote who are hourly paid employees. With the exception of the first election all employee representatives hold office for one year and until their successors are duly elected. Elections are held on July 15 and January 15, one-half of the representatives being chosen at each election. In case of vacancies occurring in ways prescribed by the plan, they are to be filled promptly by special nomination and election in the same manner as the regular nominations and elections. An interesting feature is that each employee representative appoints a deputy representative to assist him, and to take his place and vote when he is absent. There is also provision made for the recall of any employee representatives by the employees of the

precincts or divisions from which they are elected, in case their service is unsatisfactory.

Regarding the management representatives, the plan provides that upon election of the employee representative the management will announce the appointment of the management representatives on the Divisional Committees and the local Plant Conference Board, and the number of management representatives is not to exceed in any case the number of elected employee representatives.

Powers of Plant Conference Board and Committees

The duties and powers of the Plant Conference Board and of the Divisional Committees are defined in the following way :

1. The Plant Conference Board and the Divisional Committees may consider and make recommendations on all questions relating to—

- Employment and working conditions
- Wages and cost of living
- Safety and prevention of accidents
- Health and plant sanitation
- Hours of labor
- Education and publications
- Recreation and athletics
- Other matters of mutual interest

It shall afford full opportunity for the presentation and discussion of these matters.

2. The Plant Conference Board and the Divisional Committees shall be concerned solely with the policies of the company relating to the matters heretofore mentioned. When the policy of the company, as to any of these matters, has been settled, its execution shall remain with the management, but the manner of that execution may, at any time, be subject for the consideration of the Plant Conference Board.

3. If there is a disagreement over any matter before the Divisional Committee, the matter may then be reviewed by the Plant Conference Board. If any action taken by a Divisional Committee shall affect any other Division in the plant, it shall be presented to the Plant Conference Board for its consideration.

Procedure under the Armour Plan

One of the most important matters in the plan is the procedure. Any employee who wishes to bring any matters before the Divisional Committee or the Plant Conference Board may present them to the employment superintendent, either in person or through their precinct representatives. It shall be his duty, first, to ascertain whether or not the matter has been properly presented through the regular channels to the department superintendent, and if not, he shall see that this is promptly done. After that the matter may be referred to the Divisional Committees, or Conference Board, and the employee shall have an opportunity to appear before it and present the case. Any group of employees shall select not more than three spokesmen from their own number to appear before the Board of Committees.

The Conference Board or Divisional Committee may call any employee before them, to give information regarding any matter under consideration. The Conference Board or Divisional Committees, or any subcommittees appointed by them for that purpose, may go in a body to any part of the plant to make investigations. After complete investigation and full discussion of any matter under consideration by the Divisional Committees or Conference Board, the chairman shall call for a vote which shall be secret, unless otherwise ordered by the board. The employee representatives and the management representatives shall vote separately. The vote of the majority of the employee representatives shall be taken as the vote of all and recorded as their unit vote. Similarly, the vote of a majority of the management representatives shall be taken as the vote of all and recorded as their unit vote. Both the employee representatives and the management representatives shall have the right to withdraw temporarily from any meeting, for private discussion of any matter under consideration.

When the Conference Board reaches an agreement on any matter, its recommendation shall be referred to the superintend-

ent for execution, except that if the superintendent considers it of such importance as to require the attention of the general officers, he shall immediately refer it to the general superintendent of Armour and Company, who in case he approves the recommendation of the Conference Board may order its immediate execution by the superintendent. In any case where the vote in the Plant Conference Board remains a tie, the matter, at the request of either the employee representatives or the management representatives, is then referred to the general superintendent of all plants of Armour and Company. He will either within 10 days after the matter has been referred to him, propose a settlement thereof, or take it directly to a General Conference Board to be formed, as provided in Section XII. If the settlement proposed by the general superintendent is not satisfactory to a majority of the employee representatives, and if after a further period of 5 days no agreement has been reached, then the general superintendent may, if he deems it advisable, refer the matter to a General Conference Board.

General Conference Board

Machinery to consider matters of interest to the whole company is also provided in the following provisions:

1. Whenever, in the opinion of the general superintendent, any matter coming before any Plant Conference Board, affects other plants of the company, or whenever he desires to refer any matter as provided in the preceding section, he may call a General Conference Board to consider such matter, and thereafter the Plant Conference Board shall take no further action thereon.

2. The General Conference Board shall be formed in the following manner: The general superintendent shall issue a notice designating the several plants which he deems jointly interested. Thereupon, the employee representatives in the Plant Conference Board at each of the plants designated shall select a representative from their own number to act as members of the General Conference Board. There shall be one such member of the General Conference Board for the first 500 employees

in any plant, and one additional member for each additional 1,000 employees or major fraction thereof. No plant shall have less than one representative on the General Conference Board.

3. The appointment of the management representatives on the General Conference Board shall be announced by the general superintendent and shall not exceed the number of employee representatives.

Finally, there is a guarantee of independence of action in these words:

"All decisions of any General Conference Board shall be binding upon all plants originally designated by the general superintendent as being jointly interested."

And it is further declared that:

"There shall be no discrimination under this plan against any employee because of race, sex, political or religious affiliation or membership in any labor union or other organization."

In its first four months of operation, 149 matters were discussed, handled, and adjusted by the employee representation organization of Armour and Company. Of this number, 84 favored the contention of the employees and 65 that of the management.⁸ The nature of the cases was as follows:

	CASES
Lay-offs and discharges.....	48
Sanitation and working conditions.....	23
Employees' conveniences, e.g., locker rooms, dressing rooms, restaurants, etc.....	45
Wages.....	17
Safety.....	13
Pensions.....	1
Working conditions.....	4

These 149 matters would otherwise have gone without attention and adjustment under the old system of handling industrial relations.

Swift and Company Employee Representation

Swift and Company in May, 1921, installed its employee representation plan in the main plant at Chicago, and within

⁸ See report of the Industrial Relations Committee of the Institute of American Meat Packers, *The National Provisioner* (Convention Number), August 15, 1921, p. 131.

a year had it functioning in 17 plants. In all of these, employee interests and differences, not settled through the regular executive channels, are handled through assemblies and their committees by the employee members. In preparation of this and by way of education there was conducted under the direction of John Calder, manager of the industrial relations department of the company, a series of classes for some 4,000 executives and foremen at a number of plants, covering a period of 16 weeks, in modern production methods, which cost Swift and Company nearly \$100,000. In these classes matters pertaining to industrial relations were discussed which greatly aided in the success of the plan when set in motion.

Description of the Swift Plan

The general description of the plan is given in the preamble as follows:

1. The plan provides for an Assembly composed of equal numbers of elected representatives of the employees, and appointed representatives of the management, acting in detail through committees of the Assembly.⁹ The Assembly discusses and makes recommendations on all questions referred to it or raised by it, relating to the joint interests of the company and its employees and to working conditions in particular, such as wages, hours, safety, sanitation and like matters.

2. When any decision of the Assembly of Joint Representatives is reached by a two-thirds vote, it is sent to the management for action and has binding effect upon both employer and employees, unless within fourteen days the board of directors of the company, or the employees' representatives, request the Assembly to reopen the matter for further discussion.

When after such reconsideration in the Assembly it is deemed

⁹ The basis of representation shall be that the employees and the management of the plant shall have equal representation at all times and joint conference on all matters of mutual interest in about the following proportions; but in no case shall there be less than six employees' representatives in any assembly.

Total Number Employees	One Employee and One Management Representative for Each
Over 3,000.....	200 employees
1,500 to 3,000.....	150 employees
750 to 1,500.....	100 employees
400 to 750.....	75 employees
200 to 400.....	40 employees
150 to 200.....	30 employees

impossible to arrive at a collective agreement by joint conference on any one issue, the management and the employees are at liberty to take such action outside of the plan as they may think desirable, but such action will not of itself terminate the general use of the plan, which continues in full force so long as it is desired by employer and employee.

3. The committees of the Assembly consist of three standing committees and such other permanent and temporary committees as it may see fit to appoint. On one or the other of these committees every representative has a place.

The standing committees are as follows:

Committee No. 1.—On Assembly Procedure and Elections.

Committee No. 2.—On Interpretations and for Adjustment of Disputed Plant Rulings.

For the larger plants this committee is divided into sub-committees suited to the natural divisions of the plant.

Committee No. 3.—On Changes in Working Conditions.

4. All future elections, conduct of Assembly members and Assembly rules and procedure are controlled by Committee No. 1.

All personal or group differences are dealt with first through the regular plant authorities, failing which they are brought before the joint representatives of the proper section of Committee No. 2.

All proposals in the Assembly to make any change in a plant rule, standing practice, or conditions are investigated and reported upon by Committee No. 3.

5. Any employee who is actually on the pay roll of the plant, and who does not represent the management in any position of trust, like foreman, watchman, police and fire departments, and other such help is eligible as a voter. Any employee who has been four months in his department and one year with the Company, who is of legal age, is an American citizen or has first papers, is eligible for election as a representative. No favor or prejudice may be shown either by the company or by the employees towards any employee in relation to this plan by reason of the employee's race, creed, political belief, membership or non-membership in any labor union or other organization.

6. Elections for a place on the ballot and for the first employees' representatives, respectively, at any plant are conducted by a temporary joint committee of three employees and three executives of the plant; nominated by the president of the company, and with the timekeeper and one employee as judges of

election in each voting division. Notice of elections and of boundaries of voting divisions are posted in every department before the election date.

Outstanding Features of Swift Plan

Four outstanding features of the Swift plan of employees' representation may be emphasized. The first is found in the emphasis which is laid upon securing agreements through the ordinary plant authorities. Dissatisfied employees are given every liberty and assistance in presenting their case to their foreman, and in obtaining satisfaction from him. This recognition of the foreman in the first instance is a cardinal point in the plan, and raises the standard of executive performance and fairness wherever it is insisted upon.

The second feature provides that, these parties failing to agree, the matter will be taken before the proper divisional joint committee of the assembly, versed in the departments concerned, whose decision must be unanimous in order to be effective. If it is not unanimous the matter goes to the joint assembly, where a two-thirds vote is necessary for a decision—a decision binding upon both employer and employee, except that the matter may be brought up once for reconsideration. The majority of the cases are settled at this stage with all concurring.

The third feature fundamental to the success of the plan is that in case the assembly reaches an agreement by a two-thirds vote, and the minority does not concur after one reconsideration, the employer and employees are then at liberty to take any action they see fit, either jointly or independently, outside of the plan. The fourth feature is the provision that the plan is one for securing agreements, not disagreements, and that no inherent rights either of majorities or minorities on either side are sacrificed under the plan. They are just mutually suspended in the belief that an agreement can be

reached. The employees are assured that no restriction has been imposed on their ultimate free action.

These assemblies of Swift and Company represent plants employing altogether about 25,000 people. Though the qualifying service of an elected representative has to be not less than one year, the employees have shown caution and discrimination in their selections. At the Chicago plant, which is typical of the others, the average age is over 37 years and the average service is 7½ years. Some idea of the activities of the new assemblies in their first two months is as follows:

	CASES
Handled by the good offices of the joint representatives of employee and management for a voting division of the plant.....	31
Handled by assemblies' committee on procedure and elections.....	19
Handled by assemblies and committee on interpretations and adjustments of disputed plant rulings.....	19
Handled by assemblies' committee on changes in working conditions....	6
Cases carried to assembly.....	8
	<hr/> 83

Wilson and Company Employee Representation

Wilson and Company launched their joint representative committee plan at the Chicago plant in May, 1921, and great interest was displayed by the employees in the nomination and election of their divisional representatives. Immediately after election, the management selected the appointive representatives and sessions were held continuously, until the plan of procedure to govern the operation of the plan was fully agreed upon.

In the first two regular monthly meetings held as provided for in the plan, some 49 matters were discussed in open sessions and disposed of by the committee; 18 matters came under the head of working conditions, 10 on safety and fire protection, 10 on efficiency, 5 on matters of community interest, and 6 under Americanization, education, and recreation. Indicating the spirit in which the movement has been begun is the fact

that not a single case in this list reached the divisional grievance committee. The members of the joint representative committee settles the various matters in an informal way through personal effort.

The Cudahy Packing Company Plan

The Cudahy Packing Company established at its four plants a plan for equal employee and management representation on conference boards to consider matters of mutual interest. The average age of the employee representatives is 43 years, and the average time of service is 11 years.

The plan functions through committees selected by the board, every representative being on one or more committees. It was felt that in this way more interest would be developed. In this manner practically all the problems are settled in the committees, which are as follows:

Rules and Regulations Committee: Handling elections, order of procedure in meetings, interpretations of, changes in, and amendments to the plan.

Publication and Education Committee: Handling the publication of plant newspapers and such educational activities as may be developed.

Grievance Committee: Handling grievances and considering any recommendations or suggestions.

Safety, Accident, Health, Plant Sanitation Committee: This committee has taken over all plant activities covered by its name.

Recreation and Athletic Committee: Supervises all recreational, athletic, and club matters.

The Dold Fifty-Fifty Club

The Jacob Dold Packing Company at its plant in Buffalo has a plan which has for five years worked satisfactorily. It has met squarely various attempts at union organization and has maintained the plant consistently on an open shop basis. The Dold plan, or the "50-50 plan," as it is known, gets its

name from the democratic basis of equal representation and equal responsibility on the part of both employer and employee in the management of their mutual affairs.

In 1921 two of the things brought about through the Dold 50-50 Club, which is the organization through which the Dold plan functions, were, first, the mutual agreement to cut out time and one-half for overtime beyond 8 hours; second, the voluntary request on the part of the employees that in line with the reduction in living expenses and the condition of the packing business, all wages be cut a flat 10 per cent. This, of course, was accepted, and every man on the pay-roll, from the president and chairman of the board to the boys closing the cooler doors, received the cut.

This event, in most plants of any size, would have been attended by a strike or a long-drawn argument, costly and harmful to both sides, but in this case the employees knew that in years when the business was prosperous and profitable they would get their share from the employees' bonus fund, and in that way be taken care of.

Unions Urge Keeping Alschuler Régime

From the beginning of employee representation organization in packing companies, the unions, under the leaders of the Amalgamated Meat Cutters and Butcher Workmen of North America, were bitterly opposed to it. As was natural also, they advised the employees not to vote for representatives and used every argument to discredit the idea. They wished on the other hand to continue the agreement with the Secretary of Labor for prolonging the Alschuler labor administration.

In August, 1921, the butcher workmen held a meeting of local representatives in Omaha, and the officers were instructed to ask for a renewal of the existing agreement, which normally would expire on September 15. As a result, a document in the form of an agreement setting forth in great detail the pro-

visions of the existing agreement, was presented to the packers, with a request that they sign it. This was submitted by employees represented by the following organizations according to the document itself: International Union of Steam and Operating Engineers, International Brotherhood of Stationary Firemen, Brotherhood of Railway Car Men of America, Coopers International Union of North America, United Brotherhood of Carpenters and Joiners of America, International Brotherhood of Blacksmiths, Drop-forgers and Helpers, International Brotherhood of Electrical Workers of America, United Association of Plumbers and Steam Fitters of United States and Canada, International Alliance of Amalgamated Sheet Metal Workers, International Association of Machinists, Amalgamated Meat Cutters and Butcher Workmen of North America, American Federation of Labor.

This request was courteously but definitely refused by the packers, who by now had their employee representation plans functioning efficiently. This action, which was expected by the union leaders, led to a further step on their part in testing out where they stood, and whether the new organizations and workers were going to supplant them. This further step was to get justification for attempting to force the packers to recognize the unions and maintain the existing agreement. It consisted in a strike vote in the different packing centers. After this strike vote was taken in September, it was announced by the leaders that 90 per cent of their union members had voted for a strike. As a matter of fact, the actual figures were never given out, but it is clear that the union members were only a minority of packinghouse workers. Having been given the right to declare a strike, the executive committee of the Butcher Workmen called a meeting of the other unions in the industry, and it was decided not to strike until another necessary wage reduction had been announced.

The reason for this delay was to wait until the issue might be crystallized and in order to arouse the workers on the ques-

tion of wages.¹⁰ Apparently the leaders did not feel in September that they had a cause that would appeal sufficiently to the imagination of the employees, since at that time they could only ask the workers to strike against the principles of employee representation. In the summer and fall of 1921 a reduction in operating expenses in the packing industry was needed more than ever, and a wage reduction became certain, as the industry was operating without profit. Wages in other enterprises had been reduced, so that those paid in the packing industry were higher than wages paid to similar classes of labor in other business concerns in the same places. For example, common labor was receiving 45 cents an hour from the larger packers, while, on an average, 30 cents in the steel and other industries.

The larger packers found that the competition of eastern packers had become serious, since they had reduced wages. Small country butchers were also handling more livestock. On the other hand, the larger packers had suffered a shrinkage in income and also in tonnage. Their salesmen reported loss in sales that was tremendous. The selling price of their competitors was just about equal to their own cost prices. Something had to be done.

Packers Ask Wage Reduction

In November, 1921, therefore, the facts were laid before the representatives of the workers under the employees' representation plans for consideration. The whole matter of working conditions and costs of living were gone into in free discussion by representatives of management and the workers. No change in hours was proposed, but regarding wages, data on labor and other operating costs were presented, the affairs of the company explained, wages in other industries and the cost of living were examined, and the employee representatives

¹⁰ Stolberg, Benjamin, "The Stock Yards Strike," *The Nation* (Jan. 25, 1922), Vol. CXIV, No. 2951.

in some cases made their own investigations. In the case of Armour and Company a committee of 10, 5 employee and 5 management representatives, was chosen, and after 5 sessions, brought in a definite proposal of wage reduction for the consideration of the entire meeting.

The report of the committee in substance was as follows:

It has been moved, seconded and passed that the following rates be presented to the Conference Board as our recommendations. This recommendation was arrived at after several hours of deliberation and much discussion, and has been agreed to by the ten members of this committee.

The wage adjustments agreed upon for the Armour plants in Chicago, St., Paul, Sioux City, Omaha, St. Joseph, Kansas City, St. Louis, Denver, and Fort Worth follow:

Three cents an hour reduction on all rates of employees receiving 50 cents an hour or over; 5 cents an hour reduction on all rates of employees receiving 45 cents an hour and under 50 cents an hour; $7\frac{1}{2}$ cents an hour reduction on all rates of employees receiving 45 cents an hour or less, with a minimum rate of 25 cents per hour for adult female labor; an 8 per cent reduction on piecework.

Wage Reductions Put into Effect

Considered as a whole, the reductions agreed to by employees of four large packers may be summarized as follows:

Unskilled workers receiving 45 cents per hour or less, reduced $7\frac{1}{2}$ cents per hour.

Semiskilled workers receiving over 45 cents and under 50 cents per hour, reduced 5 cents per hour.

Skilled workers, 50 cents per hour and upwards, reduced 3 cents per hour.

Female labor reduced on an average of 6 cents per hour, with a minimum wage of 25 cents per hour in all cases.

Piecework rates reduced on an average of 8 per cent.

Working conditions are not changed by the new arrangements, nor is the present provision for the 8-hour day, time

and one-half for overtime, or double pay for Sundays and holidays. The 40-hour week also is guaranteed for hourly workers.

This was a reduction of approximately 10 per cent from the last scale fixed by Judge Alschuler, and the remarkable feature of this wage cut was that it was made by the employees themselves through their own organizations. It was a demonstration of the working of the employees' representation plan as put in force by several of the larger packers. On this first critical test it worked out perfectly, and its success confounded both the labor agitators and the pessimists in the industry, who said it could not be done.

Amalgamated Calls a Strike

On this announcement of a wage reduction to take effect November 28, 1921, in which 75 per cent of the employees of the larger companies voted for it, the leaders of the Amalgamated Meat Cutters and Butcher Workmen called a strike in all the large packing centers for Monday, December 5, 1921, and on that day it began, although it was not an action representative of the majority of the employees. In the first place, less than one-third of Swift and Company's employees, for example, belonged to the unions, and in the second place, the number of employees who came to work when the strike was called, was so great as to furnish good proof that the employee representation plan action had the indorsement of the workers. Over 90 per cent of Armour employees signified their loyalty to employee representation rather than the Amalgamated Union. The strike from the very beginning, indeed, was without the sympathy of the rank and file of the employees in the plants. In nearly every plant of Armour and Company, for example, the Conference Boards passed resolutions urging the employees to remain at their work and disregard the strike order.

By this action labor leaders had brought the feasibility of

industrial representation to a show-down,¹¹ and they were answered on December 5, when out of a total working force of Armour and Company in Chicago, of 6,500, some 6,012 reported for duty. These men went to work through a cordon of pickets. Again, packinghouse operations, at least so far as Swift and Company was concerned, were not materially affected by the strike. The great majority of Swift employees did not want to strike, as shown by the fact that 90 per cent of the Chicago workmen and 72 per cent of the workmen in all plants together, showed up for work the day the strike was called.

Strike Ineffective

Swift and Company actually handled more cattle and hogs during the two weeks' period after the strike was called than during the two weeks before the strike. The figures are as follows:

LIVE STOCK DRESSED IN 15 PLANTS			
WEEK BEGINNING	CATTLE	HOGS	SHEEP
November 21, 1921.....	27,606	91,338	43,099
November 28.....	36,212	137,351	63,035
Strike Called:			
December 5, 1921.....	33,853	101,336	49,195
December 12.....	32,710	135,184	59,950

After the first day of the strike, many men who wanted to work were kept away by means of a reign of terror started by the small minority who wanted to strike, and during the first week the strikers were able at times to keep nearly 40 per cent of the regular employees away from the yards. In other cities than Chicago, during the first few days also a considerable percentage were kept away. This was especially true in Omaha and St. Paul.

As was to be expected, this intimidation resulted at times

¹¹ Rogers, Sherman, "Employee Representation and the Stockyards Strike," a report of "Personal Investigation," in *The Outlook* (Dec. 20, and 28, 1921), Vol. CXXIX, Nos. 16, 17.

in violence and disorder. Certainly the picketing was for the purpose of intimidating workers to stay home from work. This was unlawful and was declared so by the courts, which issued injunctions in anticipation of disturbance from picketing operations by strikers, forbidding any violation of the law. These court orders were given force and effect by a timely decision of the Supreme Court of the United States. In this decision Chief Justice Taft declared that unions have no right to picket during a strike when it involves importunity and annoyance to workers when going to and from work, and is likely to savor of intimidation. The court declared further that each case should be considered individually to determine whether the picketing involved intimidation and restraint.¹²

As for the effects of intimidation, what Sherman Rogers, the industrial correspondent of the *Outlook*, said on the subject may well be quoted. He wrote:

The increased numbers staying away from the yards from December 6 to December 9 were not due to voluntary abstention from duty. On December 7, the yards were besieged with telephone calls from workers asserting their loyalty to the company, but declaring they were kept at home through intimidation. Women began to appear at the stock yards begging their husbands to quit work and come home because they had been told that if their husbands did not leave the yards before night "they would be killed." The wives of those stock yard workers who remained on the job were in scores of cases informed, that if their husbands went to work they did so at the peril of their lives, and, quite naturally, many women in Packingtown became hysterical with fear, and as a result their husbands remained at home.

Many other cases were reported where men attempting to leave their homes were chased back by strikers or their sympathizers and threatened with physical violence if they attempted to go to work. These cases of violence are not hearsay. I heard many of the men make their statements with my own ears.

¹² This case was *American Steel Foundries v. Tri-City Central Trades Council*, 42 U. S. Sup. Ct. Rep. 72.

It was, however, only an exceedingly militant minority that devoted all their efforts to intimidating in this way the families of the men who wished to remain at work. In every city where protection was afforded to those who desired to work, the strike was of no consequence. In cities where protection was less adequate the employees were forced to stay away. Some tragic instances of hardship were due to intimidation, as in many cases jobs had to be filled by others and those kept away had to wait for vacancies.

Effects of the Strike

The strike lasted for a few weeks in name only, when it had to be called off. For the strikers and the unions, the strike was a bitter lesson. It was the last desperate attempt of trade union leaders to gain control and leadership of the packinghouse employees. The attempt was unsuccessful, but two or three important effects in industrial relations flow from it.

First, in justice it must be said that the leadership of the unions in this labor fight was opposed to a policy of violence. The officials of the Amalgamated, James Hayes and Dennis Lane, had nothing to do with the intimidations. They deplored violence or threats of violence as much as did the officials of the packing companies. These men at the head of the unions were honorable, well-intentioned men and desired a peaceable orderly strike. This endeavor was in itself a good thing.

The second, and by all odds the most important question, was this: Were the packers to do business with the union organization, or with the delegates elected under the industrial or employee representation plan? That question's answer showed that a new stage has been reached in packinghouse industrial relations. To put it another way: Should or should not the packers have arbitrated with the Amalgamated? In

case the Amalgamated had a majority of workmen in the yards who opposed the wage reduction, arbitration might well have been instituted, but the delegates accepting the wage reduction represented a great majority, some 70 per cent of the workers and not over 10 per cent obeyed the union strike order. The packers were willing to arbitrate their difficulties with those representing a majority of their employees, and since the union did not by any means do this, they flatly refused to arbitrate with the officials of the Amalgamated.

The third effect is this: Employee representation has by this great victory won confidence for itself and become a permanent institution in the packing industry. The strike had nothing to do with wages, but was a fight by the unions to overthrow employee representation. The unions failed and employee representation is functioning in a practical way, not as a panacea but as an experiment.

It is a plan for betterment of industrial relations put into effect in such a way that "there can be no apprehension as to the fairness" of the packers.¹³ It promotes self-expression and initiative. It tends to break down hatred and distrust. It gives an opportunity for individual advancement and development. It provides a mechanism for cooperation. It typifies American idealism in economic as well as political democracy, because it offers as a basis for industrial government the same principle as the basis of civil government—the consent of the governed through their elected representatives.¹⁴

¹³ Rogers, Sherman, *op. cit.*

¹⁴ Ellerd, Harvey G., Chairman Industrial Relations Committee, Institute of American Meat Packers, in an address February 14, 1922, before the Young Men's League, Chicago Sunday Evening Club.

CHAPTER XXXIII

MONOPOLY IN THE PACKING INDUSTRY

Why Monopoly Question Is Important

The question of monopoly in the meat packing industry in the United States is of great importance at the present time from two standpoints. First, it is important from the broad view of the relations of government and the public to all large-scale business, a problem which has arisen with the tremendous industrial development of the country in the last half-century. Secondly, it is of especial significance because public opinion in these years must be educated through wide discussion in fundamental business facts, thereby focusing the attention of the consuming population sharply and clearly upon the vital and underlying principles of meat packing. In this book thus far the treatment of the industry has been largely historical. A study of monopoly at this point, therefore, affords an opportunity to take stock and to sum up what has been previously set forth.

Preceding chapters have shown how the meat packing industry developed in the United States, until there were as many as 1,300 packers throughout the country. In this process the meat industry outgrew the eighteenth century ideas of production and distribution.

In the eighteenth century production was primarily a matter of the individual producing for the home community, and of his disposing of the surplus not needed for local consumption. The theories developed at that time were not adapted to the present problems of distribution of the surplus, but were suitable for production to meet local needs. Prices were considered primarily a matter of higgling between the local producer and the local

consumer. Under the handicraft system of decentralized production and sale, the organization and the integration of industry as a whole for the nation, or for the world at large, was not necessary. Each local community was mainly self-sufficing. Division of labor had begun, but specialization in production for whole communities and for large geographical areas had not gone so far as to make them mainly interdependent. Instead of organization being regarded then as a necessity or as a virtue, it was considered an evil. Working together meant price fixing, limitation of output, or other activities at variance with the interests of society. Operators, whether workmen or capitalists, were or should be working as independent units. The industrial revolution, however, upset the self-sufficiency of the local community. Specialization under the machine technology brought a dependence of one community and one industry upon all others, so that no process and no community could function except in interdependence with all others.¹

Growth of Different Classes of Packers

With supplies of livestock in the West and the majority of the consumers in the East, thus making necessary a long haul for livestock and dressed meat, the latter becoming possible through the refrigerator car, and the development of highly specialized division of labor in processes of manufacture of packinghouse products, there was set going an irresistible tendency to promote the building of a national system of distribution as one phase of the meat packing industry. In so doing the packing industry was solving one of the greatest modern problems, that of moving food from the farm to the table. Success in this solution meant that there had to be efficiency, and this efficiency eventually ran to size, although great size in itself does not cause efficiency.²

At the same time in dealing with the problem of monopoly it must be kept in mind that in the meat industry there are several classes of units which may be grouped as follows:

¹ Camp, William R., "Reforms in the System of Food Distribution," *Journal of Political Economy* (Dec., 1921), Vol. XXIX, No. 10, pp. 824-825.

² Testimony of J. Ogden Armour before the Committee on Interstate and Foreign Commerce, House of Representatives, January 2, 1919. (H. R. 13324.)

1. Thousands of retail meat dealers who dress their own meats, of which there are some in most small country towns.
2. Hundreds of local packers everywhere throughout the country. These small concerns buy animals locally and sell their meats locally.
3. Many medium-sized packers whose sales run to \$20,000,000 a year or more.

The medium-sized packers obtain their raw materials from a greater area and sometimes from the central livestock markets, and often ship their goods into adjoining states; and some of them do an export business. If livestock were raised in all parts of the country in proportion to the number of people living in each section, small- and medium-sized packers are all that would be necessary. However, the bulk of the livestock is raised in districts far distant from the principal consuming centers, and the supply comes from different sections of the country during different seasons of the year.

4. Several large packers, who have developed a national system of distribution.

Cause of Rise of Big Packers

Regarding the work of these classes, it is well known that on account of the less perishable character of hog products, the business of local plants is confined largely to pork packing, their trade in beef and other fresh meats being limited in most cases to the demand of the local territory. The co-ordination, or interlocking of all processes of livestock production, and of the manufacture and marketing of meat products, precludes the possibility of freedom of the individual to enter upon any and every process on his own initiative. At the present time, while anyone is free to enter the packing business, it is difficult to duplicate in a day anything that has been half a century in the making. No small packer can assemble animals in the producing sections in sufficient quantity to gain all the economies

of large-scale production and utilization of by-products and to maintain a selling organization which will dispose of fresh meats economically and efficiently in markets hundreds of miles away.

It is primarily to perform this long-distance business that the large packer has come into existence, and this kind of business requires the maintenance of refrigerator cars and of a branch house selling organization. There are, however, a good many packers who maintain such an organization, and they are all in competition with one another. The five larger packers account for approximately 70 per cent of the output of establishments that ship goods in interstate commerce, but they account for only about 40 per cent of the total meat production of the country.

It is, then, not with the whole packing industry that one is concerned in treating of monopoly, but only with a part of it, namely, these five larger packers who have built up national organizations.³ The question of monopoly with which these packers are associated in the public mind is an old one and can be traced in the history of the various investigations into the industry and suits conducted by the federal government against some of the packers. Of these the report of the first government investigation of the meat packing industry was printed in 1890, just about the time that the dressed meat trade, the foundation on which the present centralized packing industry is based, became a nation-wide success.⁴ As a result of that increase in the dressed beef business there had developed with headquarters in Chicago, the great packing concerns of Swift

³ The total sales of the five larger packers amounted to \$3,200,000,000 in 1918, according to Decree and Consents, *Petition, Answer and Stipulation in the United States of America v. Swift and Company and Others*, U. S. Department of Justice (1920), p. 29.

⁴ This investigation was the result of the following resolution adopted by the United States Senate, May 16, 1888: "Resolved that a special committee of five senators be appointed by the President of the Senate, whose duty it shall be to examine fully all questions touching the meat product of the United States; and especially as to transportation of beef and beef cattle and the sale of same in the cattle markets, stockyards, and cities; and whether there exists or has existed any combination of any kind, either on the part of the Trunk Line Association, or the Central Traffic Association, or other agencies of transportation, or on the part of those engaged in buying and shipping meat products, by reason of which the prices of beef and beef cattle have been so controlled, or affected as to diminish the price paid the producer without lessening the cost of meat to the consumer."

and Company, Armour and Company, Nelson Morris and Company, and the G. H. Hammond Company. These had been leaders in the fight to get dressed beef into the markets of the country. Business in general throughout the United States had been rapidly developing during the period of the dressed beef fights, and in some lines an indication of monopoly began to appear. Because of their size and recently acquired national markets, the larger packers were made the object of governmental inquiry on charges of monopoly.

Vest Report and Its Conclusions

The investigation of 1888-1890 which resulted in the so-called Vest Report was, it would appear, a part of the campaign against the new packers, urged by the cattlemen and butchers.⁵ In November, 1888, a committee of five senators, who represented the states of Missouri, Kansas, Illinois, Nebraska, and Texas, began hearings at St. Louis, this place being chosen because the International Cattle Range Association and the Butchers' National Protective Association were in session there.⁶ The committee held hearings in other cities, and in Chicago complained that:

The people and press of Chicago naturally sympathized with the vast interest which expends millions of dollars weekly in that city, and from no quarter came the slightest sympathy or encouragement for those who were supposed to be even critical as to the packing and dressed beef establishments.⁷

In its report⁸ the committee stated that a combination existed, although "Mr. P. D. Armour testified at Washington that no such agreement existed between himself and other packers and we do not contradict this statement." For, said the committee:

⁵ Senate Reports, 51st Congress, 1st session, Report No. 829 (1889-1890), Vol. 3. These latter interests felt that the economic law of supply and demand in the matter of price was being interfered with by action of the packers. Quoted as the Vest Report.

⁶ Vest Report, p. 1.

⁷ *Ibid.*, p. 5.

⁸ The committee reported collusion in regard to: (1) the fixing of prices of beef, (2) the division of territory and business, (3) the division of certain public contracts, and (4) the compulsion of retailers to buy their beef from the packers.

It is difficult to believe that with the most apparent motive for such action the same parties, or their subordinates with their knowledge, do not avail themselves of the opportunity presented by the centralization of markets to combine for the purpose of lowering the price of cattle.⁹

It was further stated that there was a combination for the transportation of livestock and meat products. In other words there was, in the opinion of the committee, a "Beef Trust."

It seems clear that with regard to the shipping of cattle there had been the "Eveners' Combination," already described, or the "Big Four Cattle Combine,"¹⁰ which was a pooling arrangement. This was for years a common thing in many lines of business, but as to the prices of livestock, a coincidence was made a proof of combination. The fact that coincident with the enlargement of these large packing establishments there had been a decline in the value of cattle was not necessarily proof that the existence of these concerns had caused such a decline.¹¹ It is a more reasonable view and a correct one, as previous chapters have shown, that the enlarging of the supply of cattle had made it possible for these concerns to widen and increase the scope of the industry, and that such concentration of capital and effort had a most important effect in modifying or averting depreciation in values of cattle, which would have resulted without such centralization of forces for utilizing the animals and disposing of the products.¹²

The Vest Report referred also to a combination in the hog trade at Chicago which ended about 1899, but it did not put the right interpretation upon the actual situation. It is true

⁹ Vest Report, p. 6.

¹⁰ Ely, Richard T., *Monopolies and Trusts*, p. 153.

¹¹ Professor William Hill pointed out in an article in the *Journal of Political Economy*, Dec., 1904, "Conditions in the Cattle Industry," that promoters boomed range cattle production during the middle eighties until the ranges were overstocked and cattle hitherto sent to ranges for breeding were thrown on the market together with the range supply. The ensuing break in price led many to go out of the cattle business as suddenly as they went in. So the supply of cattle on the market was further increased, causing prices to go still lower. Destruction of grass on the overstocked ranges and the rapid development of the range sheep industry drove additional range cattle to the market and depressed prices even further. At this time came the panic of 1893 and the resulting depression. Consumers ate less meat, so prices were very low for a few years.

¹² *The Cincinnati Price Current* (May 8, 1890), Vol. LXVII, No. 19.

that during the seventies and eighties the American Pork Packers' Association in its report had laid down prices to be actually followed as well as method of preparation of products. However, any later agreements were ones of regulation for preparing and curing pork products and had no reference to prices for hogs. Each concern in the agreement was credited with an agreed capacity, which represented its percentage of the whole as an operating basis, and was calculated to secure to the smaller concerns due privileges in the market. No concern was actually limited in its purchases, but operations in excess of the set percentage called for an assessment of 25 cents per hog to go into the common fund, to be distributed among the participants who were falling under their percentage.¹³

"Veeder Pools" Stabilized Supplies

Similar pools were in use in regard to beef. These were known as the beef pools, or "Veeder pools," and lasted with an interruption of two years, 1896-1897, from 1893 to 1902. The object was to prevent recurrent gluts and scarcities in the various markets. The United States was divided into several territories and each Tuesday representatives of Armour and Company, Swift and Company, and Morris and Company met to consider these statements, one giving the total amount of shipments of each territory for the preceding week, a second giving the closed selling prices received by each in each territory, and a third stating the percentage shipped. At the weekly meetings it was decided how much fresh beef each should ship to various markets. Fines were provided for overshipment.

The economic effects on the public of such an arrangement were beneficial. Prices were probably stabilized to some extent through the regulation of supply in accordance with demand. At the same time the pools did not attempt to fix prices on

¹³ *Ibid.*

such a perishable commodity as fresh beef, but public opinion and the development of a body of judicial interpretation of the Sherman Law began to frown upon such arrangements. Although no action was taken on the Vest Report, it probably had some cumulative effect on the passage of the Sherman Anti-Trust bill which became law on July 2, 1890; but that bill had been introduced before the Vest Report was issued.¹⁴

During the middle nineties low prices again brought agitation among livestock producers, which gained the support of Secretary of Agriculture Morton. In 1895, a federal grand jury held sessions, but failed to bring in any indictments against the larger packing companies for violation of the Anti-Trust Act. True, they were rapidly increasing in size with enlarging markets to supply. It was not realized, however, that this was a logical development, especially with the tendency under competitive conditions to aid the growth of business already large, due to the natural action of the Sherman Law in a way its authors did not at all anticipate. With the beginning of the twentieth century, however, the leading concerns of the packing industry were subjected to judicial prosecution and to investigation on the charge of monopoly, and unsanitary conditions, all this being attended with great popular clamor.

The Grosscup Injunction

In May, 1902, Attorney-General Knox filed a bill in equity in the United States Circuit Court in Chicago under the Act of 1890, in which it was stated that the defendants, 7 corporations, 1 copartnership, and 23 individuals, had entered into a combination to suppress competition in the purchase of livestock and in the sale of fresh beef meat throughout the country, and for the obtaining of rebates from common carriers on account of their shipment of meat. The defendants entered

¹⁴ Walker, Albert H., *History of the Sherman Law*, pp. 17-47. See *Congressional Record*, 51st Congress, 1st session, p. 2467.

a demurrer, but in February, 1903, this was overruled in the opinion of Judge Grosscup, and in May, 1903, an injunction was issued against all the defendants. An appeal was taken to the Supreme Court which issued a decree on January 30, 1905, affirming, but modifying, the injunction forbidding any combination and making the decree perpetual.¹⁵

Nevertheless, it was claimed by the government that the larger packers were continuing to conduct their business in the manner forbidden by the court. As a result of the energy of the Department of Justice, on March 20, 1905, a grand jury in Chicago brought in an indictment for violation of the Anti-Trust Act against most of the parties already defendants in the case.¹⁶ To the indictment the defendants objected on

¹⁵ *Swift & Company v. United States*, 196 U. S. 395 (Beef Trust Case). Mr. Justice Holmes in delivering the opinion of the court said:

"We are bound by the first principle of justice not to sanction a decree so vague as to put the whole conduct of the defendants' business at the point of a summons for contempt. We cannot issue a general injunction against all possible breaches of the law."

The court said further (pp. 396-300): "The scheme as a whole seems to us to be within the reach of the law. The constituent elements, as we have stated them, are enough to give to the scheme a body, and, for all that we can say, to accomplish it. Moreover, whatever we may think of them separately, when we take them up as distinct charges they are alleged sufficiently as elements of the scheme. It is suggested that the several acts charged are lawful and that intent can make no difference. But they are bound together as the parts of a single plan. The plan may make the parts unlawful."

"Under the act it is the duty of the Court, when applied to, to stop the conduct. The thing done and intended to be done is perfectly definite: with the purpose mentioned, directing the defendants' agents and inducing each other to refrain from competitions in bids. The defendants cannot be ordered to compete, but they properly can be forbidden to give directions or to make agreements not to compete. See *Addyston Pipe & Steel Company v. United States*, 175 U. S. 211. The injunction follows the charge."

¹⁶ A summary of the counts in this indictment follows:

"The first and second counts of this indictment pertain only to beef sold in domestic trade. The ninth and tenth counts pertain to beef sold in foreign trade. The third count charges a conspiracy in restraint of trade and commerce among the states, and with foreign nations in fresh, dried, smoked, cured, canned and pickled meats and in certain products of the packing industry to wit: sausage casings and containers, also stock stearin and oils as well as in butter, eggs and poultry. The count charges that the trade which the defendants were carrying on in the above named commodities was to be restrained in several ways: First, competition in the buying of cattle, at the stockyards in different cities was to be prevented and destroyed by the defendants requiring their purchasing agents to refrain from bidding against each other. Second, competition as to the sale of the foregoing commodities in foreign and domestic markets was to be prevented and destroyed by the defendants fixing non-competitive and unreasonable prices on such commodities and requiring their agents in the different markets to fix prices by agreement from day to day according to what the market would stand. Third, the supply of the foregoing commodities was to be curtailed and restricted whenever necessary to the maintenance of the prices so fixed. Fourth, the United States was divided up into territories between the defendants and each was to keep its own territory, without interference by the others. Fifth, there was a division as to the volume of trade allowed to each defendant in a given market. If one packer sold more than his percentage during a given week he was obliged to pay an 'ante' of so much per cent on account to the territory in which the matter occurred into a pool to cover the excess of sales, and this fund was divided among the packers who fell short in their sales. Sixth, certain corporations, to wit, the Aetna Trading Company and the Oppenheimer Manufacturing Company, were to be appointed exclusive agents of the defendants to handle the sausage casings and containers, and those companies were

various grounds and on October 23, 1905, finally claimed immunity from such criminal prosecution through the fact that they had furnished the information to the Bureau of Corporations which was investigating the industry at that time. This plea was the immediate question for the court to decide, for the trial of the charge that the packers had violated the Anti-Trust Act was dependent upon the decision in this matter.¹⁷

The "Immunity Bath" Decision

The question before the court was this: Had the Commissioner of Corporations acting in conformity with the House resolution directing him to investigate the larger packers and in pursuance of his duties as prescribed by the law, given to the packers the immunity from criminal prosecution in respect to the charges upon which they were held?

The trial as to the facts in the case was long-drawn out. Its importance was such that the Attorney-General, W. H. Moody, argued the government's case. He held that statutory immunity could be conferred only on persons who might be subpoenaed by the Commissioner, and might subsequently give evidence in the legal sense relating to the indictment. In reply, the defendants declared that any information given was furnished under compulsion of law, though there was no subpoena. This view the Attorney-General ridiculed, describing this way of getting immunity as an "immunity bath."

The court¹⁸ gave judgment in favor of the claim for immunity to the defendants as to the natural persons, but not as to the corporations.¹⁹ This decision, although at the time

to make arrangements with the several large concerns which had been handling such merchandise in the markets of the world, for working in harmony and controlling the output and the price of the merchandise. This scheme involved the destruction or 'tank-ing' of large quantities of casings whenever the supply was too great."

¹⁷ For a scholarly discussion of this case see Walker, Francis, "The Beef Trust and the United States Government," *The Economic Journal* (London), (Dec., 1906), Vol. XVI, No. 64. Dr. Walker is now Chief Economist for the Federal Trade Commission.

¹⁸ Judge J. Otis Humphrey. The case was *United States v. Armour and Company et al.*; opinion rendered March 21, 1906.

¹⁹ The *Hale Case* (*Hale v. Hunkel*, 201 U. S. 43) had decided immunity did not apply to corporations.

it astonished the country, was undoubtedly correct.²⁰ It precluded all appeal to the Supreme Court by the government, but it had another immediate consequence of importance. As the interpretation of the matter by Judge Humphrey was so evidently not viewed with satisfaction by the public, nor by the administrative and legislative branches of the government, Congress passed an act defining the right of immunity in these words: "immunity shall extend only to a natural person, who in obedience to a subpoena gives testimony under oath or produces evidence documentary or otherwise under oath."²¹ This "immunity bath" case was unfortunate for the larger packers, even though their claims were just, for it made a bad impression on the public, which felt convinced in a general, confused way of the existence of a trust which was making extortionate profits and maintaining horribly unsanitary conditions, though in reality all these matters had no necessary logical connection with each other.

The Garfield Report on the Beef Industry

Previous to 1904 there had been frequent complaints of the advance of the price of beef, and the so-called "Beef Trust" was generally held responsible for the situation. In the first half of 1902 the price of cattle reached a very high level. In the last half of 1902, however, prices declined and continued to do so through 1903, until they reached an extraordinarily low level. There was coupled with these facts a gen-

²⁰ The essential sentences of the opinion run as follows: "If the defendants volunteered nothing, but gave only what was demanded by an officer, who had the legal right to make the demand and gave in good faith, under a sense of legal compulsion, I am of the opinion that they were entitled to immunity under the act." "The immunity flows to the witness by action of law without any claim upon his part." "I am of the opinion that under this act, when the commissioner of corporations who has power to compel, makes his demand it is the duty of the witness to obey." "But it is insisted that they did not give under compulsion, because they did not give what is known in law as under testamentary compulsion, and it is argued that testamentary compulsion means compulsion furnished by the subpoena. I am clearly of the opinion that the best judgment to be had from all the authorities is that the subpoena is a useless and superficial thing after the parties are together." "And I am also of the opinion that under anyone of those three acts in question—these three immunity laws—the production of books and papers would be legal evidence without the oath of any person where they are adduced as showing admissions against interest and against the party producing them."

²¹ This was in response to a special message from President Roosevelt, April 17, 1906, asking for a modification of the law.

eral belief that the prices of beef were abnormally high.²² Hence, great discontent developed and as a result of lively agitation among western stockmen, S. W. Martin, a representative from South Dakota, introduced in Congress a resolution which was voted on March 7, 1904, to investigate the price situation regarding livestock and beef, and to find out whether in the form of trust or otherwise a combination controlled the trade in livestock and meats.²³

The man charged with conducting the investigation was J. R. Garfield, Commissioner of Corporations, and as the matter was looked on as an official investigation of a trust, the report was awaited with great interest by the public. The investigation was carried out in a thorough manner. Government statistical data, trade paper figures, and vast amounts of material from the books of the packers concerned, were brought together in "such comprehensive and voluminous form

²² There was difficulty for the public in arriving at a definite conclusion because of the absence of reliable statistics of cattle being fed and slaughtered. If, as was claimed, there was really a loss of 5,000,000 cattle between 1890 and 1900, as the census showed, a very effective combination was required to keep prices as low as they were in 1902 and 1903. If the fact that market receipts were greater than ever before was accepted as proof of inaccuracy in the census reports, which was very likely, as subsequent study has proved, no monopoly theory was required to explain the low prices. The conclusion reached depended on the data selected, and there was plenty to make a strong case for either side.

From the point of view of demand for beef with the return of business activity after 1893, meat consumption increased and meat prices were on the upward trend from 1889 to 1901. "The short corn crop of that year caused a good many cattle to be prematurely marketed in the fall and winter of 1901 and depressed prices temporarily, while curtailing the supply that would normally have reached market in 1902. The high price of corn caused many cattle to be held over and fed in 1903. Thus the 1902 supply was cut short at both ends, and as workmen were fully employed at good wages, the price of cattle reached a higher point than had been seen in 20 years." (Hill, William, "Conditions in the Cattle Industry," *Journal of Political Economy*, Dec., 1904.)

In the natural course of events the price of fresh beef had increased for three reasons: (1) the increase in population, which was gradual, amounted to almost 30 per cent between 1890-1900, (2) the greater population of persons living in cities and towns—in 1890 43 per cent of the population were classed as urban and semiurban, while in 1900, 48 per cent were so classed. These two classes constituted the beef-consuming portion of the population; (3) the better industrial conditions which prevailed generally in all industries giving steady work and good wages. (Croxtan, F. C., "Beef Prices," *Journal of Political Economy*, March, 1903, p. 209.)

²³ "RESOLVED: That the Secretary of Commerce and Labor be, and he is hereby, requested to investigate the causes of the low prices of beef cattle in the United States since July 1, 1903, and the unusually large margins between the prices of beef cattle and the selling prices of fresh beef and whether the said conditions have resulted in whole or in part from any contract, combination in the form of trust or otherwise, or conspiracy, in restraint of commerce among the several states and territories or with foreign countries; also whether the said prices have been controlled in whole or in part by any corporation; joint stock company or corporate combination engaged in commerce among the several states or with foreign nations; and if so to investigate the organization, capitalization, profits, conduct and management of the business of such corporations, companies and corporate combinations and to make early report of his findings according to law."

that any intelligent person who examined the material could not question their authenticity or their representative character."²⁴ As a result of this work the report appeared in March, 1905, and covered the beef industry, with the exception of a discussion of illegal combination or conspiracy in restraint of trade, on account of the judicial prosecutions against the larger packers which were then pending, as has been noted.²⁵

Garfield Findings on Prices and Profits

The report estimated the amount of business done by the larger packers, first in comparison with the total slaughter of beef cattle in the country, and second, in relation to the total slaughter at the eight principal western slaughter points. The larger packers slaughtered almost 45 per cent of the total number of beef cattle in the country, and 97.7 per cent of those at the principal slaughter points.

In the matter of comparison of price movements of cattle and beef the report did good service, for though cattle prices were understood, the public did not have an intelligent idea about the prices which the packers received for beef. When the average man spoke of beef prices he invariably mentioned the price of porterhouse steak. The report, however, showed to the surprise of the public that the actual amount obtained from the sale of the dressed carcass, deducting transport costs, was less than the amount paid for the live animal. This difference and the profit of the packer were covered by the by-products. It was made clear further that on account of the varying importance of the beef and the other products of a carcass, a margin reckoned between the pound price of cattle and the pound price of the dressed beef was very misleading as to the real situation, on account of the great varieties in the price of hides and fats.

²⁴ Walker, Francis, "The Beef Trust and the United States Government," *The Economic Journal* (London), (Dec., 1906).

²⁵ Report of the Commissioner of Corporations on the Beef Industry, March 3, 1905.

With regard to these margins the Martin resolution declared they were unusually large in 1904. The report of the Commissioner of Corporations pointed out that as a matter of fact the margin between cattle and beef prices for the period from July 1, 1902 to July 1, 1903, was 2.02 per cent. This meant that although the prices of cattle had fallen greatly the prices of beef had also fallen to about the same extent.²⁶

The general public was mostly interested in the question of profits and the report of the Commissioner dealt with that in a very significant chapter. A calculation was made with great nicety on the basis of a large proportion of the total business of the large packers. For a number of plants of various concerns in different cities aggregate figures were shown of the weight and price of livestock, and the weight and price of beef sold from these same cattle, together with the proceeds from the hides and offal. To those knowing the business the result was expected, but to the public the remarkable feature of this analysis was the proof of the fact that the slaughter houses worked on a small margin per head.²⁷

The calculations of the Bureau of Corporations showed a profit of 82 cents per head, or \$1.35 per hundredweight of dressed beef.²⁸ These figures were checked by the bookkeeping records of the packers which showed a true average of 99 cents per head, or 17 cents higher than that computed by the bureau.²⁹ The records of the packers were taken by the bureau as being more accurate.

Garfield Report Stated Profits Moderate

This profit of about \$1 per head on cattle, or $\frac{1}{4}$ cent per pound on dressed beef, though large in the aggregate because

²⁶ The Beef Industry (Garfield Report), p. 268.

²⁷ E.g., see figures in the report for the year ending June 30, 1904. The figures relate to 2,013,658 beef cattle. The average live weight equalled 1,115 pounds; the average cost \$4.15 per hundredweight, or \$46.23 per head, and the total cost including killing was \$48.19. The average dressed beef weight of the beef carcass was 629 pounds. Average selling price deducting transportation was \$6.25 per hundredweight, or \$39.26 per beef carcass; the average value of the by-products was \$9.75 per beef carcass; the total proceeds \$49.11 per beef carcass.

²⁸ The Beef Industry (Garfield Report), p. xxx.

²⁹ *Ibid.*, XXXII.

of the volume of the business, was not an undue profit according to the conclusions of the report.³⁰ It was pointed out by the Commissioner, however, that this profit was only that of the beef business of the packers. The calculations might have underestimated the profits of that in two ways: (1) in not getting the profits of the subsidiary manufacturing processes so far as they applied to the beef business; (2) in not getting the profits of the private car lines so far as they handled the beef products.³¹ These, it was considered, were beyond the scope of the inquiry. It was noted also that these figures did not represent the total profits of these concerns, because for that there must be taken into account the hog and sheep business and the profits from private cars and the trade in by-products and related lines.

Although the report did not present in detail the general financial operations of the concerns investigated, it made the following comparison of its conclusions with the published reports of Swift and Company:³²

The profits of Swift and Company on their beef business would be in the neighborhood of 12 per cent upon that proportion of their capital stock which is assignable to the beef industry. If, as appears probable, there is no overcapitalization in the case of this company, the rate of profit on the true investment in the beef business would be approximately the same. In this connection, it is of interest to note that the total sales of Swift and Company for the year 1904 were approximately \$200,000,000, and the total profits \$3,850,000, equal to about 1.9 per cent of the volume of sales.

Commissioner Garfield's report was received with open incredulity by a large part of the press and by a great majority of the people of the country. This was due, as Dr. Walker pointed out, to the glamor of the imaginary "Beef Trust"

³⁰ *Ibid.*, pp. 268-269.

³¹ And in some cases undoubtedly packers received additional returns through rebates, e.g., the four Sulzberger Schwarzschild officials who were indicted by a federal jury July 1, 1905, for alleged violation of the Elkins Anti-Rebate Law, appeared in court and pleaded guilty. Pleas were accepted and fines of \$10,000 and \$5,000 were assessed. *The National Provisioner* (Sept. 23, 1905), Vol. XXXIII, No. 13, p. 15.

³² The Beef Industry (Garfield Report), p. 269.

which exercised a great power throughout the West, a glamor so great that authentic figures were of little avail to dispel the belief that the profits of the packers were of a phenomenal size.³³ This being the state of the public mind it was natural for critics to refuse to accept the computations of the bureau and to proceed to make crude estimates as to the profits.³⁴

Criticisms Not Based on Facts

The New York Evening Post on March 4, 1905, ridiculed the idea that the packers were making only 2 per cent profits. This was a misreading of the report. What it really said was that the packers reported about 2 per cent profits on their sales. The Commissioner certainly did not imagine that a profit on sales would be mistaken for a profit on capital, especially since in the body of the report, the published profits of some of the packers, amounting to a very substantial figure, were discussed in some detail. Those who saw that a 2 per cent profit on sales would amount to a handsome profit attacked the Commissioner for failing to see this.

Among others who criticized the report was Charles Edward Russell, whose articles in *Everybody's Magazine* in 1905 were afterwards published in book form as "The Greatest Trust in the World." This was brilliantly written, but was too sweeping in statement and reflected too clearly the attitude of muck-raking to convince a careful reader. Like other criticisms of this order it revealed the slender basis of the critic's information and reasoning. However, competent and disinterested parties acquainted with the business were satisfied with the conclusions of the report. Moreover, with regard to the general correctness of the result no critic was in

³³ Walker, Francis, "The Beef Trust and the United States Government," *The Economic Journal* (Dec., 1906), Vol. XVI, No. 64, p. 501.

³⁴ For example, one ambitious effort was that of Cuthbert Powell in the *Kansas City Journal*, May 13, 1905, which gave the total profit at \$7.41 per head. J. J. Ryan, Secretary of the Corn Belt Meat Producers' Association, figured it out at about \$8. (*Sioux City Tribune*, April 1, 1905.) *The New York American*, March 5, 1905, made a guess at \$3.06 per head. Others went as high as \$15 on by-products alone, e.g., *Butler (Missouri) Times*, April 20, 1905.

a position to disprove, much less make actual calculations, because nobody unless he had access to the figures of the packers could by any possibility have the necessary data.³⁵

Formation of the National Packing Company

In 1902, the three largest packers as individuals had worked out a plan to merge their interests in a single large corporation, and to bring under its ownership also a number of smaller packing companies. Several consolidations in other lines of industry had been formed in 1900 and 1901, such as the United States Steel Corporation, and this plan within the packing industry was similar to those.³⁶ This plan did not go through, however, although the financing had been arranged with the New York bankers, Kuhn, Loeb and Company, as Jacob Schiff saw the panic of 1903 in the offing and refused to go ahead.

Hence the larger packers having bought several small packing companies, decided to bring them together under a holding company. This was done and these small companies were organized under the National Packing Company.³⁷ The three larger packers, Armour, Swift, and Morris, took the stock on the basis agreed on for the merger, namely, the basis of the tangible assets of the three large packing companies. Against this National Packing Company the government sought an indictment in 1910 for violation of the Anti-Trust Act, and

³⁵ The report dealt with only certain phases of the business because judicial prosecution was in progress. There was also no investigation of the matter of private car lines or rates of transportation, for at the time the question of the jurisdiction of the federal government over private car lines was in litigation, and it would have been improper to assume it. The fact that the report gave facts contrary to the current ideas of the public did not invalidate it, nor indicate that the Bureau had shown any partiality for the packers. As a matter of fact it had supplied evidence to the Department of Justice which the latter tried to use in its suit against the packers then in progress, but for which the defendants successfully claimed immunity.

³⁶ For details see report of Federal Trade Commission (1918), Summary, pp. 47-48, and Part II, Chap. I, Secs. 4 and 5, and Swift and Company's Analysis and Criticism of Part II of this report, pp. 12-14.

³⁷ The National Packing Company acquired the properties and business of the following: Omaha Packing Company, G. H. Hammond Company, Hammond Packing Company, Anglo-American Provision Company, Fowler Packing Company, Stockyards Warehouse Company, and the pledged shares of the capital stock of the United Dressed Beef Company, Anglo-American Refrigerator Car Company, Kansas City Car Company, Fowler's Canadian Company (Ltd.), Friedman Manufacturing Company, and the St. Louis Dressed Beef Company.

as a result the jury brought in an indictment, although one had been thrown out by Judge Landis.³⁸

This indictment of the National Packing Company and its subsidiaries recited that prior to March 18, 1903, these companies were carrying on trade as wholesale dealers in beef; that in carrying on such trade these corporations through their respective purchasing agents bought where markets for the sale of cattle originating in the different cattle raising regions of the different states of the United States then existed, and that they shipped beef "to their respective agents located at the markets for the sale of beef in the several states of the United States"; that prior to the formation of the National Packing Company the corporations were independent of each other in the matter of conducting the portions of said trade and commerce so being carried on by them respectively, and after that company was formed should have continued to conduct the same strictly in competition with each other, and would so have done but for the fact that since the formation of the National Packing Company the corporations named "unlawfully have engaged in a combination among themselves and with the National Packing Company in restraint of such trade and commerce that is, a combination having for its object and necessary result the prevention and elimination of all competition between said first named corporations and the fixing of uniform and non-competitive prices for their beef and the selling of the same in said markets at such prices so fixed, which has been accomplished by each of the said first named corporations surrendering the control and direction of its share of said trade and commerce to said National Packing Company and permitting said National Packing Company to dominate its affairs."

The indictment was not followed up, however, and the

³⁸ On the ground that "the court is not clothed with authority to supply entirely by inference the complete omission of so fundamental an element of the offense," as a charge showing that any statutory offense—fixing prices, dividing territory restraint of trade—had been committed within the last three years, the statutory period, Judge Landis ordered another grand jury to hear testimony for finding valid indictments.

dissolution suit against the National Packing Company was dismissed, although the packers' attorneys claimed the government could not do so without some definite settlement of the case being made.

The Case of 1912 against the Packers

The government had dismissed the civil bill to bring criminal prosecution. This criminal action was taken in December, 1911, against Louis F. Swift and 10 other packers.³⁹ The trial was a long one, beginning on December 6, 1911, and ending March 25, 1912. The main contentions of the government were:

That the combination was a most powerful combine or system for suppression of competition and the fixing of prices; that the indicted packers or their predecessors have dominated the meat industry and fixed prices since 1880; that the real purpose of the National Packing Company was to continue the work "accomplished by the old pool"; that the key to the system is the uniform method used by the members in figuring the test cost of the product; that this test cost arrived at by adding the killing charge to the price of cattle on the hoof and deducting allowances for hide, and fat, is in excess of the real cost and gives the packers a larger margin of profit than their own figures indicate; that the country was divided under the old pooling system into different divisions and each member of the pool allotted a certain percentage of the business and that a similar system is still in existence; that a system of forfeits was paid to members who failed to get their percentage of the business of the different divisions and these forfeits were in the nature of fines on those members who exceeded their allotment; that since the organization of the National Packing Company the directors of the organization hold meetings at which the price of the product is fixed; that a specially devised code of trade terms was used at these meetings where prices were made.

³⁹ United States v. L. F. Swift *et al.*

After the evidence submitted by the government, the defendants to the surprise of the public made no defense and rested their case with the jury on the evidence of the government's own witnesses and on the arguments of counsel, claiming that that evidence was in corroboration of the packers' contention that they were in active competition.

Judge's Charge to the Jury

In summing up the situation in his charge to the jury Judge Carpenter stated:

The question of fact for the jury to decide, therefore, is whether or not the defendants deliberately and intentionally combined together to eliminate competition among themselves, or to fix, regulate and control prices of fresh beef. . . . The mere size of the business operated by the defendants or corporations in which they are interested is no proof of the accusations in the indictment, nor is their individual wealth, nor the wealth of the corporations in which they are interested. . . . In other words, it is not wrong for a merchant to endeavor to increase profits. It is not wrong for two or more merchants by agreement to adopt similar methods of business for that purpose, but if their plan to that end involves the concerted doing of things which naturally and obviously violate the law, and by agreement or understanding they do those things which naturally and obviously violate the law in order to accomplish their purpose, then the fact that they fall short in profits, or even make a loss, is no defense if prosecution follows.

In order to warrant you in finding a general verdict of guilty on all the counts of this indictment it is necessary that the Government shall have produced evidence before you establishing the following facts, and satisfying you beyond all reasonable doubt of their guilt:

(1) That the defendants whom you find guilty did, during the three years from September 12, 1907, to September 12, 1910, carry on the trade described in the indictment and in substantially the manner which is described in the indictment.

(2) That during the same period competition in the matter of cattle purchases and fresh beef sales, such as normally and usually exists between such traders, was prevented, restrained, restricted, stifled or eliminated, and the sales prices of fresh

beef were fixed, regulated and controlled as the direct result of a combination between such defendants, entered into for that purpose. . . .

I charge you particularly that the defendants here are not to be convicted merely upon suspicion; they are not to be convicted merely because you think such a conviction might be popular.

Verdict of Jury "Not Guilty"

Following this the jury returned a verdict of "not guilty." Soon afterwards the National Packing Company, which had not been a financial success, was voluntarily dissolved, though it is true the government was contemplating resumption of the civil suit. The properties were sold to the Swift, Armour, and Morris companies.

This verdict was of fundamental importance, for it declared that the main contention of the prosecution in attempting to prove monopoly charges, which was the fact of fairly constant percentages of purchases of livestock taken by the various packers, was not evidence of agreements to divide livestock receipts. This is something which the facts presented in the earlier chapters of this book have shown clearly. The verdict was of great significance also because it was on a phase that was the fundamental charge in later investigations.

To sum up, the monopoly charge has always been based almost entirely on the fact that the percentage of livestock receipts purchased by each packer remains approximately constant from year to year. However, never has any real evidence of collusion in this matter been cited. There have been considered merely the approximately constant percentages as in themselves *prima facie* evidence of agreement. For example, in prosecutions letters have been quoted which refer to "our share," and "all we are entitled to," as though such expressions implied an agreed division. Any business man would know that such evidence is worthless. The expression "our share" is one that any business concern is likely to use in referring to sales results. If the representative of one of

the larger packers should say that his company is getting all the livestock it is entitled to in a certain market, he would merely mean that his company is buying all that it could buy without forcing up prices to the point where meat products would have to be sold at a loss.

It is in this thought that the explanation of the approximately constant percentages largely lies. Each company is constantly endeavoring to increase its percentage, but is met at every step by the competition of the other packers. On the other hand, no one of them intends to see any other packer gain on it by so much as a fraction of 1 per cent, if it can help it. The result is that with everybody keeping close account of everybody else in an open market place, no single packer can increase his percentage substantially. Furthermore, it has been proved that the same phenomenon of approximately constant percentages applies to other industries where there is no charge of collusion, and that such large figures are involved that a small percentage means a large actual change.⁴⁰

The importance of these early investigations, from the point of view of the packing industry in its public relations, is that an opportunity was given to the industry to state the fundamental operations of the packing business, which when understood threw a different light upon the whole subject of monopoly in the packing industry, and showed that the popular idea had been based upon ignorance of these business facts. There have been later investigations, however, and in them many of the old accusations already discussed have been repeated, with this additional feature that was not present in the earlier controversies, viz., a growing feeling, whether rightly based or not, on the part of Congress and the public, that the meat-packing industry should be regulated by the government itself. These later controversies involve some review

⁴⁰ Testimony of Dr. L. D. H. Weld, representing Swift and Company, in Hearings of the House Committee on Agriculture on The Meat-Packer Legislation, pp. 1023-26, March 11, 1920, on H. R. 6492, 66th Congress, 2nd Session. See also Dr. Weld's statement (pp. 1179-1080, Part XV), "If we try to exceed our customary purchases in any market, we could not get away with it, that is all. To do that we would have to raise the bid over the market price. Morris, Armour and Wilson would not stand for it. They would meet our prices and there would be cut-throat competition."

of old accusations, but also discussion of new developments. As their history and the whole tangled skein of public controversy has never been set down in order in a connected account, the following chapter will deal with these later investigations and show the situation at the present time.

CHAPTER XXXIV

THE FEDERAL TRADE COMMISSION INVESTIGATION

Monopoly Question Reopened

The question of monopoly, while settled in law in 1912, was reopened during the years of the Great War from 1914 to 1918. Although the case of 1912 had resulted in an acquittal of the five larger packers on a charge of monopoly which meant that competition existed among them, the whole matter once again became one of public and congressional controversy, the results of which have brought far-reaching changes, for good or ill, in the relation of the packing industry to government and the public through the definite establishment of government regulation. While from the point of view of efficiency the wisdom of the results may be questioned, from the standpoint of allaying an unwarranted public prejudice, the action of the industry's leaders in acquiescing in the result was well considered. With the passage of the Packers and Stockyards Act, 1921, often referred to as the Packers Federal Control Act, a new era in the public relations of the packing industry began.

The last investigation of the meat-packing industry began in February, 1917, through an order of President Wilson to the Federal Trade Commission, the result of two years' general agitation and one of congressional inquiry. The agitation ending in the first inquiry or investigation in 1890 (Vest Report) was begun by livestock producers; the second, resulting in the Garfield Report, was due to the meat consuming public's impatience with high meat prices; the Federal Trade

Commission's inquiry was, like the Vest Report, the culmination of the livestock producers' deep-rooted feeling that something was wrong with the centralized system of marketing livestock, that the violent fluctuations in the prices of livestock in recent years were not justified by the natural law of supply and demand.¹

The packers had partly lost touch with the producers. The older generation of the large packers, in some cases at least, had been cattlemen and had cultivated friendly relations with livestock producers, but the growth of the industry had resulted in the present generation of packers leaving relations to subordinates. This gave an impression of indifference. When the season of 1915 brought heavy and unexpected losses to the feeders, who had counted on higher prices with cessation of imports and increased exports and diminished supply, a conference on marketing of livestock was held in Chicago.² This was under the auspices of the United States Bureau of Markets and invitations were extended to livestock men, packers, and wholesale and retail dealers. As the packers did not attend in person and explain why prices had not moved up at this time of crisis, the cattlemen felt slighted and this feeling seems to have precipitated the fight.³

The first gun was fired in January, 1916, at the annual meeting of the American National Live Stock Association at El Paso, Texas. The larger packers were there, but the association appointed a marketing committee to make a study of conditions, and passed resolutions calling on Congress to remedy abuses.⁴

¹ Letter from Dwight B. Heard, President, American National Livestock Association, to Hon. David F. Houston, Secretary of Agriculture, July 9, 1915. Hearings before Senate Committee on Agriculture and Forestry, 65th Cong., 3rd Session, on S. 5305, Part 2, p. 1997.

² A. E. de Ricqlès at the Chicago conference; see also *Wallace's Farmer*, Nov. 26, 1915.

³ Virtue, G. O., "The Meat Packing Investigation," *Quarterly Journal of Economics* (Aug., 1920), Vol. XXXIV, No. 4, p. 628.

⁴ One of these resolutions was as follows: "Whereas the big meat packers of the United States are largely in control of stockyards, and the terminal facilities thereat: of the slaughter and distribution of cattle, sheep, hogs, and poultry, and the products thereof, including hides; of tanneries and the products therefrom; of many of the articles made from horns and hoofs, including glue, buttons, combs, etc., of cottonseed oil mills and refineries, the products of which are used in the manufacture of lard compounds, soaps, and various oleo products; and Whereas they also largely control the

Investigation Asked for

In February, without the knowledge of the livestock men, a resolution directing an investigation of the meat packing industry was introduced into Congress by Representative Borland of Missouri.

The marketing committee already mentioned supported it for the whole year, but the packers were opposed because they held it would result in a one-sided investigation, instead of an impartial inquiry. The wording of the resolution which directed the Federal Trade Commission "to investigate and report to the House of Representatives the facts relating to any or all violations of the anti-trust laws of the United States," was stated by the packers to indicate an assumption of their guilt.⁵ On the other hand, the packers declared that they were prepared to have an investigation covering the whole industry "from hoof to table." So the fight went on, each side employing strenuous lobbying tactics to support its contention. Finally, the Borland resolution was killed, when on January 8, 1917, an amendment to the Agricultural Appropriation bill was passed providing only \$50,000 for an investigation of the marketing of livestock by the Department of Agriculture.

The next action to secure an investigation was taken by those who had actively supported the Borland resolution. President Wilson was urged to inaugurate an inquiry by giving an order to the Federal Trade Commission to conduct such inquiry.

prices of fertilizers with which the fertility of farms of the Nation is maintained; and Whereas, they also largely own and control the refrigerator cars and icing facilities used in the transportation of fruits, vegetables, and other perishable products; and Whereas, in many localities of production they control the price paid for and the distribution of fresh and canned fruits, and are thus able to influence the effect of supply and demand and to cause violent fluctuations in prices, to the great detriment of the producer and without benefit to the consumer; and Whereas, such control as recited above, gives those possessing it a practical monopoly on the marketing of foods and other necessities of life, and is a menace to our country: Therefore be it

"RESOLVED that the American National Live Stock Association does hereby petition the legislatures of the several states of the American Union and the National Congress to enact such laws as will correct the abuses complained of, to the end that relief will be afforded to the consumers and producers of the country; and we recommend that in the laws so enacted it shall be provided that any violation of the same shall be punished by imprisonment instead of by the imposition of fines." (See Hearings on Senate Bill 5305, Part 2, p. 2001.)

⁵ Weld, L. D. H., "The Meat Packing Investigation: A Reply," *Quarterly Journal of Economics* (May, 1921), Vol. XXXV, No. 3.

Trade Commission Starts Inquiry

On February 7, 1917, after a few days' consideration the President directed the Federal Trade Commission to "investigate and report facts relating to the production, ownership, manufacture, storage, and distribution of foodstuffs and the products or by-products arising from or in connection with their preparation and manufacture; to ascertain the facts bearing on alleged violations of the anti-trust acts, and particularly upon the question whether there are manipulations, controls, trusts, combinations, conspiracies, or restraints of trade out of harmony with the law or the public interest," to the end that "proper remedies, legislative and administrative may be applied." ⁶

On July 1, 1917, funds for carrying out this direction became available and the Commission began the most controversial inquiry it had undertaken.⁷

The actual investigation lasted about one year, during which time special investigators and legal counsel were employed. Great energy and zeal were displayed. True, the method was not that of a legal trial. Yet on the part of the commission itself it was a legal inquiry, rather than an economic one. The latter phase was left for the Department of Agriculture. As conducted the investigation was not a trial in which any parties were defendants and thereby entitled to appear by attorney, but was an investigation into the economic

⁶ Federal Trade Commission Report on the Meat Packing Industry, Summary, p. 23. Letter to the President, July 3, 1918.

⁷ The report came out in five parts at intervals from 1918 to 1920. In August, 1918, the summary of findings and recommendations appeared, and several months later Part II, dealing with evidences of combinations among the packers. Part I, describing the growth and present position of the meat packing industry, especially of the five larger companies, was published in June, 1919; Part III, "Methods of the Five Packers in Controlling the Meat Packing Industry," later in the year; Part IV, "The Five Larger Packers in Produce and Grocery Foods," in the spring of 1920; Part VI, prepared by the Department of Agriculture, a study of the cost of fattening, growing, and marketing beef animals, appeared in 1920. Later, Part V, "Profits of the Packers," was published. Two special reports were also put out, one on Wholesale Marketing of Food and the other on Private Car Lines. This report was undertaken under difficult circumstances and was subject to the objections E. N. Hurley advanced as Chairman of the Commission before the inquiry was started, viz., it would take a long time to compile and present a report. During wartime an abnormal situation existed, and if it ended before the inquiry, a period of readjustment would make conclusions doubly difficult; again a voluminous report comes out when public interest has waned and officials accept conclusions but do not care to wade through a report. (Hearings on Senate Bill 5305, p. 2010.)

conditions as well as practices that might be prevailing and it was *ex parte*.

In carrying on the investigation the Federal Trade Commission made a very comprehensive survey, and the result was the accumulation of a great mass of data. In handling them, however, the commissioners seemed to be proceeding on a theory of the general desirability of government regulation of industry. This was natural, especially at the time the inquiry was begun. The federal government had not taken over the operation of large industries at that time and the lesson of the shortcomings of government operation had not yet been learned.

As a natural consequence there seems to have been on the part of the commissioners a desire to establish a case at all costs in favor of the government regulation of industry.

Again, members of the Commission and the economists, while able men, did not seem to have had first-hand knowledge of the packing business. The reports were notable also for a journalistic freedom of expression and a lack of dignity, contrasting badly with reports of commissions in other countries.⁸ Yet the report represented a very interesting stage in the development of public opinion regarding the government supervision and regulation of industry, or at least of essential industries. As such, it is important in the light of the later relations that the packing industry and the livestock marketing machinery of the United States were to have with the United States government. That aspect of the report, as a forecaster of future government regulation of the packing industry, overshadows the correctness or falsity of the details of its conclusions as to monopoly in the industry. As for these conclusions they have been accepted with more and more caution

⁸ This sweeping condemnation of the larger packers by the Trade Commission was not borne out by subsequent testimony in public hearings where a large number of small packers appeared and testified that their business did not exist by sufferance of large packers, as charged by the Commission; that they were in direct competition with the large packers and found them to be fair in their practices and that they had no complaint to make; that they were all of them growing, and that there was open and free competition at the various markets. In addition, nearly 200 livestock producers testified that free and open competition existed in the purchase of livestock at the various stockyards.

and reservations by the business community, as time has elapsed. The contrast just noted appeared the more striking after the publication in England in 1921 of the Final Report on Meat, prepared by a subcommittee appointed by the standing Committee on Trusts and presented to the British Parliament. In Section 13 the British report stated:

The Federal Trade Commission reported that a combination exists in the United States between the five large companies named. Our witnesses who had bought in the United States assured us, however, that they had never received anything but keen competition among the large packers.

Trade Commission's Conclusions

Summarizing its conclusions the Federal Trade Commission on the other hand in its letter to the President said:

It appears that five great packing concerns of the country—Swift, Armour, Morris, Cudahy and Wilson—have attained such a dominant position that they control at will the market in which they buy their supplies, the market in which they sell their products, and hold the fortunes of their competitors in their hands.

Not only is the business of gathering, preparing, and selling meat products in their control, but an almost countless number of by-product industries are similarly dominated; and not content with reaching out for mastery as to commodities which substitute for meat and its by-products, they have invaded allied industries and even unrelated ones. . . .

If these five great concerns owned no packing plants and killed no cattle and still retained control of the instruments of transportation, of marketing and of storage, their position would not be less strong than it is. The producer of livestock is at the mercy of these five companies because they control the market and the marketing facilities, and the refrigerator cars for distribution. The consumer of meat products is at the mercy of these five because both producer and competitor are helpless to bring relief.

In conclusion the Commission charged:

(1) That the five large packers "are in an agreement for the division of livestock purchases throughout the United

States according to certain fixed percentages." (2) That the five large companies "exchange confidential information which is used to control and manipulate livestock markets." (3) That they "act collusively through that buyer by means of such practices as (a) 'split-shipments' purchases; (b) 'part-purchases'; (c) 'wiring on'; (d) 'making' the daily market." (4) That they have combined with certain other companies to restrict and control shipments from South America to the United States and other countries. (5) That they act collusively in the sale of fresh meat. (6) That there is a joint contribution to funds by the five large packers; and (7) That there is a joint ownership of various enterprises.

Remedies Recommended

The remedies recommended by the Commission, influenced by the war period in which they were made, were:

1. That the Government acquire, through the Railroad Administration, all rolling stock used for the transportation of meat animals and that such ownership be declared a Government monopoly.

2. That the Government acquire through the Railroad Administration, the principal and necessary stockyards of the country, to be treated as freight depots, and to be operated under such conditions as will insure open, competitive markets, and uniform scale of charges for all services performed and the acquisition or establishment of such additional yards from time to time as the future development of livestock production in the United States may require.

3. That the Government acquire, through the Railroad Administration, all privately owned refrigerator cars and all necessary equipment for their proper operation and that such ownership be declared a Government monopoly.

4. That the Federal Government acquire such of the branch houses, cold-storage plants, and warehouses as are necessary to provide facilities for the competitive marketing and storage of food products in the principal centers of distribution and consumption, the same to be operated by the Government as public markets and storage places under such conditions as will afford an outlet for all manufacturers and handlers of food products on equal terms. Supplementing the marketing and storage facilities thus acquired, that the Federal Government

establish, through the Railroad Administration, at the terminals of all principal points of distribution and consumption, central wholesale markets, and storage plants, with facilities open to all upon payment of just and fair charges.

Packers' Reply to Commission Charges

The main charge made against the larger meat packers by the Federal Trade Commission was, as always, regarding the marketing of livestock. That great problem has been treated at considerable length in a previous part of this book, and the complicated processes and fluctuations in receipts and prices traced as to their causes and results. But it is well at this point to state, or at least to summarize the arguments or replies made in the voluminous congressional hearings and in published statements by the representatives of the meat packers. Such statements show the natural business facts behind many processes, and aid in understanding the fundamentals of the industry.

To the first charge, that approximate uniformity of livestock purchase percentages indicates a monopoly agreement, the packers' reply is that as a matter of fact such uniformity is an indication of active competition and of the close watch that each packer keeps on the others.⁹ This results in the proportion of livestock bought by each remaining fairly constant from year to year, as has been pointed out at the end of the previous chapter.¹⁰ The fact that the purchase of livestock is carried on in open organized market places where each packer can watch the other closely makes it very difficult for one to gain on the others. This has been said to mean a lack of "cut-throat" competition, and it is true to this extent, that if one packer recklessly tried to increase his percentages by

⁹ An interesting discussion of both sides of the question as to monopoly in the meat packing industry is contained in two articles in the *Illinois Law Review* (March, 1921), Vol. XV, No. 8; "The Federal Trade Commission and the Packers," by Henry Veeder, and "The Packers and the Public," by Walter L. Fisher.

¹⁰ See Swift and Company's Analysis and Criticism of Part II of the Report of the Federal Trade Commission, April 5, 1919, pp. 27 *et seq.*, and also Hearings before the Committee on Agriculture and Forestry, U. S. Senate, 66th Congress, 1st session, Senate Bills on pp. 2199 and 2202 (1919), testimony of L. D. H. Weld, pp. 461-543 and pp. 565-630.

bidding up the market, that is, paying more than the dressed meat value of the animals warranted, he might be followed by the others, but all would lose money and it would not increase trade, for all taken together have a fairly definite capacity and established business.¹¹

The second charge that there is exchange of confidential information used to manipulate livestock markets is met by the statement that there is no collusion of any kind, but that as a matter of good business, for competitive reasons, each packer keeps records of the purchases of other packers. It is a fact also that the official journal of the industry, *The National Provisioner*, publishes weekly complete statistics of this kind for the leading livestock markets. Packers need this kind of detailed and accurate information concerning receipts and slaughters.

Regarding the third charge of collusion in livestock buying through various specified practices, the replies of the packers take up and explain these practices in detail.

Livestock Buying Methods Explained

It is pointed out that part purchases arise quite naturally from the fact that a shipper may send in several carloads of cattle of the same type and weight, bringing the same price, on any one day. Any one packer's requirements range from the finest to the poorest, and he could not use a large number of the same type and weight. In this case a packer-buyer will bid only on a part of the shipment, dealing only with the commission man and having no arrangement with any other buyer. The commission man will then sell the remainder to another buyer.

¹¹ Swift and Company summarize their reply on this head as follows: "Taken all in all, therefore, it has been shown: (1) that the Federal Trade Commission fails to prove that the fairly constant percentages of purchases are the result of agreements among the packers; (2) that there are enough instances of variation in purchase percentages, as in the cases of St. Paul, South Omaha, and Denver, to prove that there is no agreement to divide receipts; (3) that such approach to uniformity as exists is the result of competitive watchfulness that each packer keeps on the others; (4) that even if there were an agreed division of live-stock receipts this would carry with it no power to control prices of livestock in the various markets and no power to control the prices of dressed meats." (Analysis and Criticism, p. 41.)

The term "split shipments," according to the Trade Commission charges, meant cases where shippers divided their shipments between two markets and the split lots would be sold for the same prices on different markets, and this they were enabled to do by the checks the packers kept on all such shipments. It has happened, the packers state, that buyers for one packer at a particular point will wire to other buyers of the same company regarding split shipments, but the better reason for the same price is that judgment of cattle buyers is so exact that bids on cattle of the same weight and quality in one market would be nearly, if not exactly, the same in another market. Further, commission firms with offices at different markets keep each office informed of such shipments.

"Wiring on" is a practice declared to be illegitimate by the Commission. It was claimed that when cattle in one market would not bring a price satisfactory to the seller or commission man and he shipped them to another market, the buyer in the first market would wire the buyer in the second market notifying him as to the price offered. This would result in the price being the same or less in the second market, tending to discourage such shipments. This was a legitimate matter of market information to send, but in deference to suspicions of shippers was discontinued by packers.

As for the "making" of the daily market and that it results in depressing prices, the statements of the packers declare that while it is true that since the large packers are the principal buyers, their bids have the greatest influence in establishing the price from day to day, the price goes up as frequently as it goes down.¹² Moreover, it pointed out that for several

¹² In other words, the Federal Trade Commission has overlooked in the matter of prices the fundamental fact that packers conserve values. This is pointed out in an editorial in *The Chicago Journal of Commerce*, February 13, 1922, as follows:

"A great service is traced by *The National Provisioner* to the packers in conserving values, or preventing them from demoralization, during the time of greatest decline since the armistice. The values so benefiting, of course, were in the domain of livestock. *The National Provisioner* very interestingly says:

"From June, 1920, to June, 1921, there was a tremendous fall in the values of farm products, which, as is well known, resulted in disturbing the whole business of the country to a very unfortunate degree.

"Some of these declines are startling. For example, corn, wool, wheat, cotton, potatoes, oats and alfalfa dropped from 50 to 82 per cent; fruits and vegetables fell

years the trend of prices was very steadily upward. While buyers often do not go into the yards early, it is because prices seem too high, or there is no need for more livestock. Though there is no obligation to go into the yards to buy early, the packers have co-operated with shippers and commission men to start buying as early as possible.

South American Situation

The charge that the large packers control and restrict shipments from South America to Europe is answered by the following statement :

The truth of this matter is that for several years the large American packers have had arrangements with each other and with certain foreign companies providing for the proportion of total shipments that each should carry between South America and England. Such a division of business was not only justifiable because it helped to make more regular the receipts of perishable meats in England, but the arrangement itself, made necessary largely by the lack of adequate boat space, was not secret, and was countenanced by British law. Furthermore, this arrangement is similar to the form of co-operation specifically permitted by the recent Webb Bill, which is intended to encourage co-operation in exportation on the part of competing firms in the United States.¹³

No Collusion in Selling Meat Products

The fifth main charge against the larger packers was that they act collusively in selling fresh meat products in the United States. The Commission argued that :

about 46 per cent; farm seeds 59 per cent; dairy and poultry products 25 per cent; and miscellaneous products 52.5 per cent.

"Livestock values declines show well when compared with the values cited. For statistics indicate that during the same period cattle prices declined only 39 per cent and hog prices 45 per cent.

"The importance of these figures for the packer is that they prove that farm commodities marketed through the packers actually suffered less in the price catastrophe than anything else that the farmer produces. At the same time wholesale prices of meat were exceptionally low.

"This means that products marketed through the livestock markets and the packer distributing systems had their values conserved. The system was not only efficient, but it was quick and continuous. Because this distribution of livestock and meats was thorough and unhalting, the values of these products were saved from disastrous fluctuations. The system has been justified by its results."

¹³ Swift and Company, Analysis and Criticism, pp. 62-63.

Inspection of one another's branch-house stocks enables the packers "to prevent an over-supply of fresh meat in any market"; that prices are kept uniform by the exchange of information as to "margins" on the sale of meats; and that retail butchers find "no perceptible difference in the prices charged by the different big packers." It also explains that there is "rotation in price cutting," in order to drive small packers out of business.¹⁴

The reply of the packers points out that there is no such periodical inspection of stocks, that occasional interchange of information as to what margin had been made on sales in a previous period is of no harm, being much less than is done in recognized open market associations, and that:

Although prices charged by the larger packers in the same market are approximately the same, there are sufficient variations to cause retail butchers to shop around from the branch house of one packer to the branch houses of the others, so that they can buy their meat to the best advantage. If they did not find differences in price for the same qualities of meat, it would not be worth their while to spend as much time as they do in shopping around. This fact was not mentioned by the Federal Trade Commission.¹⁵

As further evidence that there is no control of prices of dressed meats and other food products, it was pointed out by Everett C. Brown, president of the National Livestock Exchange, that:

Under the regulations of the Federal Food Administration, the packers were allowed to earn nine per cent, on invested capital in the case of edible meat products, which constituted the bulk of their business. If they really did "control the prices of dressed meats and other foods," they certainly should have been able to take the nine per cent allowed them by law as a fair maximum. Here, however, is what the United States Food Administration stated in its report for the year 1918:

"The profits on the controlled products of the packers subject to this control during the first year of such regulation from November 1, 1917, to November 1, 1918, as shown by

¹⁴ Swift and Company, Analysis and Criticism, p. 67.

¹⁵ *Ibid.*, p. 67.

audited accounts were \$40,594,935 on an investment average for the year of \$714,187,204, a net profit on the total investment for one year under the rules of the Food Administration of 5.6 per cent or considerably less than the maximum allowed by those rules."

On the gross sales of \$2,434,113,430 the profit of \$40,594,935 represents a percentage of only 1.6 per cent.¹⁶

The Matter of Profits

The Commission in its report on profits, on the other hand, charged that packers made inordinate profits and cited these alleged profits as indications of monopoly.¹⁷ To this it might be stated that the report of the United States Food Administration and the financial reports of the packers, which are subject to audit by the Treasury Department, show not only the inaccuracy, but the absurdity of this charge. The packers' claim that their profit averages only a fraction of a cent a pound, or about 2 cents per dollar of sales, has never been disproved. Further, the charge of exorbitant profits made by the larger packers is linked with one that they have tended to crush independent packing companies.

The real fact is that in 1914, 65 independent packers earned 12.6 per cent on net worth, while the five large packers only earned 8.3 per cent. In 1915 these large packers earned less than the 65 independent packers by a narrow margin. In 1916 five large packers averaged 18.5 per cent against the independent packers 22.1 per cent. The average for the three years shows a rate of profitability considerably to the advantage of the independents. The larger packers if they had any monopoly power over livestock prices at one end and meat prices at the other would not have suffered such severe and staggering losses as they underwent in the general price decline following the war. The financial statements of the five larger packers for 1921 show these losses to be as follows:

¹⁶ National Livestock Exchange Bulletin, January, 1921.

¹⁷ See Part V, Profits of the Packers.

	OPERATING LOSS	DEFICIT
Armour and Company.....	\$31,709,817	\$35,256,796
Swift and Company.....	7,812,291	19,812,291
Morris and Company.....	5,063,506	11,972,541
Wilson and Company, Incorporated....	8,462,052	9,206,269
The Cudahy Packing Company.....	1,569,563	1,569,563

Depreciation of inventories was responsible for the greater part of these enormous losses of an abnormally lean year—losses which would have bulked even larger were they not to be viewed against the background of the accumulated surplus of many fat years.¹⁸

The situation shown in these losses disposes effectively of any such charges of the existence of monopoly shared by the five larger packers over the meat trade of the country. This is true although it is inconceivable now that any new firm can rise to their class. The situation is rather, as acknowledged by Mr. Herbert Hoover in an opinion rendered by him as Food Administrator to President Wilson on September 11, 1918, that there is a situation where sharp competition between these larger packers might in time tend to reduce this number and not increase it.¹⁹

¹⁸ *The National Provisioner*, January 7, February 4, February 11, and March 18, 1922.

¹⁹ See comment by Fisher, Walter L., *Illinois Law Review*, March, 1921, p. 516.

CHAPTER XXXV

THE PACKING INDUSTRY AND GOVERNMENT REGULATION

Result of Attacks on Packers

The result of the Federal Trade Commission's report on the packing industry was very far reaching, both economically and practically. From the business point of view the packing companies found their volume shrinking, both in the United States and abroad, and on the other hand, public opinion was so aroused against them, even though it was not soundly based, that drastic regulatory legislation was proposed¹ and government regulation of the packing industry was definitely established as a dramatic result.

It is the relations of the industry with the government arising out of this situation that concern us here. The report was acted upon in 1919 by the Department of Justice, on the assumption that "such a degree of probability of monopoly had been established" as to warrant prosecution under the Anti-Trust Law.

A federal grand jury made an investigation at Chicago during September and October, 1919, but failed to return an indictment.² Following this, the Department was preparing to carry on a similar investigation in New York. All this time, in spite of the failure of the jury to bring in an indict-

¹ For example, the report was sent to the heads of all foreign governments having representatives at Washington. The effect in Great Britain has been commented upon in an earlier chapter. In New Zealand the reading of the report led to the refusal of an export license to Armour and Company of Australasia, Ltd. It was only after protest of the United States Department of State in which it was declared that the report did not express the opinion of the United States government, but only of the Commission that arrangements were made in New Zealand, whereby by becoming a member of a new meat export port, Armour and Company was allowed to export meats.

² Virtue, G. O., *op. cit.*, p. 677; and Weld, L. D. H., *op. cit.*, p. 420.

ment, public opinion was under the influence of the Trade Commission's report and expected and urged that something be done. The larger packers realized that although this state of affairs might not be warranted, yet quite apart from any question of monopoly affecting a few in the industry, it was working great havoc with the business of the whole industry. They felt, at the same time, that they had not had a fair hearing before the Trade Commission, and, therefore, they intimated that before any action was taken by the Department they desired to have an opportunity to state their case. This was allowed. Many congressional hearings were held on the various bills introduced into Congress as a result of the Trade Commission's report,³ and conferences began which finally ended in the agreement between Attorney-General Palmer and the packers embodied in a decree handed down by the Supreme Court of the District of Columbia.⁴ This marked another step in the progress toward final government regulation.

Summary of "Consent Decree"

Under this decree the defendants, and each of them, either as corporations or as individuals, are compelled in brief:

(1) To sell under supervision of the United States district court preferably to livestock producers and the public, all their holdings in public stockyards; (2) To sell, under the same supervision, and in like manner, all their interests in stockyard railroads and terminals; (3) To sell, under the same supervision and in like manner, all their interests in market newspapers; (4) To dispose of all their interests in public cold storage warehouses except as necessary for their own meat products; (5) To forever disassociate themselves from all "unrelated lines," including

³ Some of the more extended hearings on certain bills in Congress were as follows: Hearings before the Committee on Interstate and Foreign Commerce of the House of Representatives, 65th Congress, 3rd session, on H. R. 13394, January, 1919; Hearings before the Committee on Agriculture and Forestry, U. S. Senate, 66th Congress, 1st session, on S. 2199 and S. 2202 (1919); and Hearings before the Committee on Agriculture, House of Representatives, 66th Congress, 2nd session, on Meat Packer Legislation (1920). These hearings began in December, 1918 (on the Sims bill), and the last hearing, the one on the Anderson bill, closed on April 12, 1920. These hearings occupied in all about six months of actual time and their record required over 9,000 printed pages.

⁴ This was known as the "Consent Decree" and the agreement as the Palmer-Packer agreement. The case was U.S.A., petitioner, v. Swift and Company, *et al*, 37623 Equity, Washington, Government Printing Office, 1920.

wholesale groceries; fresh, canned, or salt fish and a large number of other commodities enumerated; (6) To forever abandon the use of their branch houses, route cars and auto-trucks comprising their distribution system, for any other than their own meat and dairy products; (7) To perpetually submit to the jurisdiction of the United States district court under an injunction forbidding all the defendants from directly or indirectly maintaining any combination or conspiracy with each other, or any other persons, or monopolizing or attempting to monopolize any food product in the United States or indulging in any unfair and unlawful practices. (These packers were also forbidden to engage in retailing.)

This decree further provided that jurisdiction is perpetually retained by the court for the purpose of taking such other action or adding at the foot of the decree such other relief, if any, as may become necessary or appropriate for the carrying out and enforcement of the decree, or for the purpose of entertaining at any time hereafter any application which parties may make with respect to this decree.⁵

It is interesting to note that while the packers gave up the handling of groceries and other "unrelated" products, they were allowed to deal in cottonseed oil and oleo, and butter, cheese, eggs, and poultry were left out of the agreement. It has been strongly urged that the decree would seem to have been the result of an active propaganda on the part of the Southern Wholesale Grocers' Association whose monopoly was threatened by the competition of the packers.⁶ The outcome of the decree left the grocers in control, a fact which did not make the Federal Trade Commission enthusiastic over

⁵ The packers in consenting to this decree admitted no guilt and were not adjudicated guilty. The first paragraph of the decree contained this statement: "That while the defendants and each of them, maintain the truth of their answers and assert their innocence of any violation of law in fact or intent, they nevertheless, desiring to avoid every appearance of placing themselves in a position of antagonism to the Government, have consented to and do consent to the making and entry of the decree now about to be entered without any findings of fact, upon condition that their consents to the entry of said decree shall not constitute or be considered an admission, and the rendition or entry of said decree, or the decree itself shall not constitute or be considered an adjudication that the defendants or any of them have in fact violated any law of the United States."

⁶ See Haney, Lewis H., *The Case against the Meat Packers*, Jacksonville, Florida, 1919. Dr. Haney was at that time Chief Economist of the Bureau of Research and Publicity of the Southern Wholesale Grocers' Association. He had formerly been with the Federal Trade Commission.

the decree.⁷ The language of the settlement indicates that the Attorney-General held there was a combination and the defendants declared there was not. One thing seems clear, namely, that efficiency in the operation of the packing industry was not going to be increased by the decree, which threw so many restrictions about its normal business development.

Proposed Regulatory Legislation

At the same time that this settlement was being made between the Department of Agriculture and the larger packers, various bills regarding the packing industry were introduced in Congress. Many hearings were held by numbers of committees, and thousands of pages of testimony were printed.

The bills before Congress reflected for the most part the statements of the Federal Trade Commission and the war psychology of a period when the government was widely extending its activity.⁸ This resulted in a feeling in certain quarters that some industries were increasing too rapidly.⁹ Most of the early bills died in committee and had little chance of passing even as war measures, and certainly none after the signing of the armistice. Public opinion soon condemned them as being too extreme. One of these, the Sims bill, was designed to place all the marketing facilities in the hands of the government, but it contemplated leaving the packers to carry on their business as they thought best. Another, the Kenyon bill, provided for a system of licensing for all interstate slaughterers, commission firms, operators of stockyards, large handlers of poultry and dairy products, and all stockyard news services.

⁷ It is interesting to note that charges of the Southern Wholesale Grocers' Association were brought against the packers for prejudicial practices in shipment, but the Interstate Commerce Commission dismissed the complaint and declared that the packers should be allowed to continue their present methods of distribution through branch houses and peddler cars. *The Chicago Journal of Commerce*, July 22, 1921; also I. C. C. Report No. 10745, National Wholesale Grocers' Association of the United States v. Director-General, Alabama and Vicksburg R. R. Company *et al.*

⁸ H. R. 13324 65th Cong., 3rd Sess. See hearings before Committee on Interstate and Foreign Commerce in five parts.

⁹ The Bureau of the Census of 1921 issued figures showing the industrial growth of the country, 1914-1919. These are a few striking comparisons: Total value of products, meat packing, 1914, \$1,454,495,000; 1919, \$3,714,340,000. (The American Exchange National Bank Bulletin, July, 1921.).

The power to grant and to suspend or revoke licenses, and to regulate and investigate, was to be vested in the Secretary of Agriculture. Packers were forbidden to indulge in unfair practices, from dividing purchases of livestock or unreasonably affecting the price of livestock and engaging in the manufacture or dealing in side lines where the effect may be "to substantially lessen competition or tend to create a monopoly." The packers were to sell within two years their interest in stockyards. A provision of very questionable value, too, was that regarding refrigerator car service. While allowing the packers to retain ownership, the aim was to compel them to pool their cars with those of the carriers. This the packers were willing to do if assured of adequate supply by the carriers.

Another bill, introduced by Senator Gronna, was an evolution of all previous bills, and aimed at the same general ends as the Kenyon bill, but had a much narrower scope. For this Gronna bill dealt only with packers and "operators" of stockyards. While the taking out of a license was permissive rather than obligatory, there was for all practical purposes no difference. Under this bill there was to be created a Federal Live Stock Commission to enforce its provisions, and the commission was to have the power of investigation similar to that of the Federal Trade Commission.

Packers Urge Legislation Unnecessary

Against these bills the meat industry protested, stating that the packing industry was already supervised and regulated by more laws, federal, state, and municipal, than any other industry in this country.¹⁰

It went further and stated that :

The Federal Trade Commission has power to inspect our books and records and ascertain every fact of public interest. . . .

¹⁰ See also Analysis of the Bill creating a Federal Livestock Commission prepared by the Institute of American Meat Packers, March 4, 1920.

It has the power to prevent unfair methods of competition . . . and it also has the power to prevent packers from discriminating in price between different purchasers of our products where the purpose might be in any respect unlawful.

The Department of Justice has the power to enforce existing laws against illegal combinations, if any existed in this industry.

The Secretary of Agriculture has the power under existing law to gather and promulgate information relating to the demand for, supply, consumption, costs and prices of, and the facts relating to production, manufacture, storage, distribution of livestock and livestock products and other commodities handled by the packers.

Among the numerous laws already in force supervising and regulating the packing business may be mentioned the following: Federal anti-trust acts; Federal Trade Commission act; Federal pure food acts; Federal meat inspection acts; Federal oleomargarine act; Federal butter act; Federal labor acts; Federal internal revenue acts; Federal income and excess profit laws; Interstate Commerce Commission regulations; Department of Agriculture regulations; State anti-trust laws; State corporation laws; State public utilities regulations; State inspection laws; State oleomargarine laws; State butter laws; State cold storage laws; State pure food laws; State sanitary laws and regulations; State fertilizer laws; State feedstuff laws; State labor laws; State tax laws; State industrial court laws; City inspection laws; City sanitary laws and city tax laws.

Government Regulation a Fact

Finally, of all these proposed measures, the bill introduced by Representative Haugen of Iowa became law on August 15, 1921.¹¹

This new law, the Packers and Stockyards Act, begins a new era in the history of the packing industry. The best

¹¹ H. R. 6320 "To regulate interstate and foreign commerce in livestock, livestock products, poultry, poultry products, dairy products, and eggs and for other purposes." Cited as "Packers and Stockyards Act," 1921.

summary of it has been given by the man charged with its enforcement, the Secretary of Agriculture.¹²

The act, as far as it relates to the packing industry, covers the buying of livestock in interstate or foreign commerce for slaughter, manufacture of edible and inedible products from livestock, and the marketing of them, and dairy products, poultry and poultry products, and eggs, but does not apply to the butter unless the handling of such dairy and poultry products is associated with the business of buying and slaughtering livestock. The act includes not only the actual shipment in interstate commerce, but also any transaction having in prospect the ultimate shipment in interstate or foreign commerce.

Packers are prohibited from employing any unfair, unjustly discriminatory, or deceptive practice, giving undue preferences, apportioning supplies, or manipulating or controlling prices which in any way would create a monopoly or restrain commerce.

If, after a hearing the Secretary should find a packer guilty of any of the acts forbidden, he shall order the packer to discontinue them. Procedure is outlined whereby both the packer and the Secretary may carry the case ultimately to the Supreme Court of the United States. The law, it should be noted, safeguards the packer against criminal prosecution until he has been cited to a hearing, has been heard, has been found guilty, and has been ordered to discontinue the illegal act. Even then he may appeal to the courts.

Packers are required to keep accounts and records in such form as will disclose fully all transactions and ownership. If they do not, the Secretary is authorized to prescribe the manner and form in which they may be kept. Penalties are attached for violating the Secretary's order.

The powers of investigation of the Federal Trade Com-

¹² Address of Hon. Henry C. Wallace, before Institute of American Meat Packers, August 9, 1921.

mission are, in the case of the packing industry, transferred to the Secretary of Agriculture. Hereafter, the Federal Trade Commission will exercise its powers of investigation only when requested by the Secretary.

This is the essence of the act so far as it relates to the packers, but it applies also to stockyards and commission merchants.¹³

All stockyard owners and commission merchants must establish and observe just, reasonable, and non-discriminatory regulations and practices and furnish services at reasonable published rates. They are forbidden to charge more or less and must not extend to any person any services not specified in the schedule.

Failure to comply with the regulations or orders of the Secretary makes the offender subject to civil and criminal penalties and a proceeding for damages by the person injured. If the Secretary considers that a rate, charge, regulation, or practice is in violation of the law he may determine and prescribe reasonable rates and charges.

In other respects the same regulations apply as to the packers.

Government and Packers Co-operate

An organization to execute the act was provided for, headed by an administrator working under the Secretary of Agriculture. An appropriation of \$200,000 was made and it was specified that no one in the personnel is to receive more than \$5,000 salary. The administration has been organized under the official title of the "Packers and Stockyards Ad-

¹³ It is this part of the act; i. e., so far as it provides for the supervision by federal authority of the business of the commission men and of the livestock dealers in the stockyards of the country, that was tested in the courts as to its constitutionality. The Supreme Court of the United States declared the act constitutional in the cases 687, *T. F. Stafford et al., v. Henry C. Wallace, Secretary of Agriculture, and Charles F. Clyne, U. S. Attorney for the Northern District of Illinois*; and 691, *J. E. Burton et al. v. Charles F. Clyne, U. S. Attorney for the Northern District of Illinois*. These cases were decided May 1, 1922. "The stockyards are not a place of rest or final destination," but "a throat through which the current flows," and as such being only an incident in interstate commerce, they and livestock commission men are subject to the regulatory power of Congress, according to the decision read by Chief Justice Taft.

ministration," under the direction of Chester Morrill, assistant to the Secretary.

Acceptance by Packers of New Status of Industry

The fact of the situation was that public opinion demanded some kind of legislation. The packers realized that they had made a great mistake in 1906 and later in attempting to ignore public opinion. They were right in urging that while the stockyards might be considered as public utilities, the packing industry itself is a private industry "because it has no natural monopoly and because it buys and sells merchandise at fluctuating prices just like any other private industry."¹⁴ They had felt justified in taking but a reasonable profit, as in any other private business.

However, the public felt a deeper concern regarding meat, and the packers at last acknowledged that though theirs was a private business, the public had shown such interest in meat that its opinion, whether right or wrong, must be recognized as an important force in the development of the industry. No unjust prejudice on the part of the public should be allowed to arise.

This new attitude of the packers was the result of a great change on the part of the industry as to the place of co-operation by producers, consumers, and government in essential though private industry. Summing up the new attitude, Thomas E. Wilson, president of the Institute of American Meat Packers, stated¹⁵ that he had no objection to reasonable supervision that would enable the government producers and the public to know whether the industry was run efficiently, whether the profits were reasonable and treatment of competitors fair. If legislation would allay public prejudice it was desirable and could be accomplished without harm to the business.

¹⁴ Weld, D. L. H., "The Meat Packing Industry Investigations: A Reply," May, 1921, p. 430.

¹⁵ Annual address, August 8, 1921.

In concluding his address before the Institute of American Packers at its annual convention banquet, Hotel Drake, Chicago, Secretary Wallace stated the future of the packing industry in relation to government and the public in these words:¹⁸

The power placed in the hands of the supervising agency is very great and could be used to cause much annoyance and unnecessary expense to those who come under the law. Therefore, I wish to make it perfectly clear that without prejudice of any kind, my whole effort will be to administer the law in a constructive way. There will be no arbitrary or offensive exercise of power. There will be no interference with the free operation of legitimate business nor imposition of burdensome and unnecessary rules and regulations. Discretionary powers will be used fairly and with due regard to all concerned. . . . I am going to come to you for counsel, for advice and cooperation because we are all working in a common cause, for a common nation, and we can serve her more largely by conferring, by cooperating in absolute good faith, than we ever can by the old plan of individual selfish effort

The administration of the act in the first year of its operation proved the truth of this statement:

¹⁸ August 9, 1921.

CHAPTER XXXVI

TRENDS IN THE AMERICAN MEAT INDUSTRY

Extent of Meat Packing

Following a study of the monopoly question in the meat packing industry, it is fitting to consider in this final chapter the situation of the industry at the present time, its extension over the whole country, and the various changes taking place in its structure that are of fundamental importance.

First, it is interesting to take note of the extent of the industry. This survey may act as an antidote for those whose idea of the whole enterprise is the result of the widely circulated conception of a monopoly of meat packing throughout the United States controlled by a few powerful companies. The meat packing business is not only the largest industry in Chicago, but also in the United States and probably in the world, when measured by value of product, according to the United States official census reports in recent years. It is probable, also, that no other industry in the world operates on so small a margin of profit and renders such efficient service. In 1849 the census enumerated only 185 establishments, in 1869 there were about 768, by 1914 the number had risen to 1,279, and in 1919 the total was 1,305.

Because of the lack of uniformity in the classification of establishments in the different censuses the number of establishments is not, however, an indication of the development of the industry. The growth is shown by the number of wage earners, the amount of wages, the cost of materials, and the value of product reported in each census. However, by whatever measure the growth has been very great. The

value of the products of these 1,305 establishments in various parts of the country in 1919 was \$4,246,290,000.

Some Comparisons

The next largest individual industries as reported by the Bureau of the Census are: iron and steel, steel works, and rolling mills, \$2,812,775,000; automobiles, \$2,387,833,000; foundry and machine shop products, \$2,321,129,000; flour mill and grist mill products, \$2,193,007,000; cotton goods, \$1,887,919,000. The census figures also show that during the year 1919 the packing industry paid out for raw materials, principally livestock, the enormous total of \$3,774,901,000, or about 89 cents for every dollar of value in the finished products. The packers' manufacturing margin, including wages and all production expenses, amounted to only about 11 per cent of the total value of the finished products. The average manufacturing margin for all industries in the United States in 1919 was about 40 per cent.

The value of the output of the packing industry throughout the United States in 1919 exceeded the combined turnover for 1920 of the following corporations of national scope: Cluett, Peabody Company, Baldwin Locomotive Company, American Locomotive Company, Procter and Gamble Company, B. F. Goodrich Company, Federal Rubber Company, United States Rubber Company, Westinghouse Electric and Manufacturing Company, General Electric Company, Bethlehem Steel Corporation, United States Steel Corporation, American Tobacco Company, The J. I. Chase Threshing Machine Company, Endicott Johnson Corporation, American Sugar Refining Company, White Motor Company, Stutz Motor Company, United Drug Company, Western Electric Company.¹

¹ The preliminary statement of the 1920 census consists of a statement of the number and cost of animals slaughtered, and the quantities and values of the principal products manufactured during the year 1919. The figures are compiled from 1,305 establishments. The statistics for 1919 and 1914 are summarized in the following tables. Those for 1919 are preliminary and subject to such change and correction as may be necessary from further examination of the original reports.

MATERIALS		1919		1914	
	Cost	Number	Cost	Number	
Total cost.....	\$3,774,901,000	.....	\$1,441,663,000	.....
Animals slaughtered...	3,055,495,000	.....	1,199,642,000	.....
Beefes.....	1,055,319,000	10,818,000	490,108,000	7,149,600	
Calves.....	95,720,000	4,395,000	27,623,000	2,019,000	
Sheep, lambs, goats, and kids.....	146,965,000	13,523,000	84,813,000	15,952,000	
Hogs.....	1,757,491,000	44,519,000	597,098,000	34,442,000	
All other materials....	719,406,000	.....	242,021,000	.....

PRODUCTS		1919		1914	
	Value	Pounds	Value	Pounds	
Total value.....	\$4,246,290,000	.....	\$1,651,965,000	.....
Fresh meat:					
Beef.....	846,806,000	4,932,284,000	421,297,000	3,658,334,000	
Veal.....	83,884,000	422,928,000	26,299,000	194,699,000	
Mutton,lamb,goat, and kid.....	120,451,000	501,201,000	74,676,000	629,233,000	
Pork.....	532,075,000	2,112,243,000	226,535,000	1,877,099,000	
Edible offal and all other fresh meat..	59,832,000	516,983,000	20,576,000	296,667,000	
Cured meat:					
Beef, pickled, and other cured.....	28,360,000	129,960,000	14,395,000	91,572,000	
Pork, pickled, and other cured.....	1,217,420,000	4,145,232,000	393,605,000	2,929,310,000	
Canned goods.....	96,904,000	305,943,000	26,418,000	166,799,000	
Sausage:					
Canned.....	27,985,000	161,002,000	9,845,000	74,004,000	
All other.....	145,601,000	629,701,000	58,350,000	435,147,000	
Lard.....	415,817,000	1,372,550,000	120,414,000	1,119,189,000	
Lard compounds and substitutes.....	123,724,000	521,122,000	33,037,000	396,398,000	

	Value	Gallons	Value	Gallons
Oleo oil.....	\$30,953,000	20,339,000	\$11,926,000	16,502,000
Other oils.....	9,153,000	6,721,000	4,010,000	6,715,000
		Pounds		Pounds
Tallow and oleo stock..	36,536,000	242,084,000	13,733,000	209,614,000
Oleomargarine.....	36,778,000	123,639,000	8,819,000	60,388,000

	Value	Number	Value	Number
Hides and pelts:				
Cattle hides.....	\$185,020,000	10,818,000	\$69,959,000	7,159,000
Calf.....	24,797,000	3,353,000	3,513,000	1,464,000
Sheep, lamb, goat, and kid.....	33,780,000	12,244,000	13,624,000	15,917,000

	Value	Tons	Value	Tons
Fertilizers and fertili- zer material.....	\$18,315,000	391,000	\$8,737,000	294,000
All other products*....	172,099,000	.....	92,197,000	.....

*Includes value of ammonia, butter, butter reworked, condensed milk, glue, glycerine hog hair, ice sausage casings, scrapple, soap, wool, etc., and amount received for slaughtering and refrigeration for others.

Value of Packing Output

The output of Chicago's slaughtering and meat packing establishments in 1919, numbering more than 60 and prob-

ably in excess of 100, was valued, according to the most recent census figures, at the tremendous total of \$1,083,090,049. This sum represented practically a third of the value of the output of all manufacturing industries in Chicago combined, which was \$3,658,740,000. Approximately one-seventh of all the meat produced yearly in the United States is dressed and processed in the more than 60 establishments at Chicago. This amount is sufficient to supply the population of the 15 largest cities in the United States, or to provide a pound and a half of meat for every living human being in the United States for one year. A daily average of almost one and one-quarter million dollars' worth of livestock was sold during 1921 in the Chicago stockyards.

In value of product the industry is largely centralized in a few states, and of these Illinois is by far the most important. In number of establishments it has been surpassed by New York, Ohio, Pennsylvania, and California, but those in Illinois in general are much larger than those in any other state. The relative importance of that state in the industry, declined, however, during the decade previous to the war, as in 1904 its products formed 34.7 per cent of the total of the United States as compared with 29.4 per cent in 1914.

Meat Packing Follows Frontier

To study the progress of meat packing, as outlined in the chapters of this book, is to trace in a special application the significance of the frontier in American history, first stated in its general application by Professor Frederick J. Turner of Harvard.² For meat packing centers have been established in the wake of the livestock raising industry as it spread westward with the development of the country. The relation of centers of livestock production to the center of population in the development of the industry must be summed up here and the economic changes resulting discussed.

² Proceedings American Historical Association, December, 1920, "Economic Bases of the American System of Large Scale Meat Packing," by Rudolf A. Clemen.

From the maps printed at various points in the text it will be seen that the center of population has not moved westward at the same rate as have the centers of production. This is shown graphically by the increasing length of lines with each decade from 1840 to 1920, inclusive. If the centers of production agreed approximately in their location with the center of population, the majority of the demands for meat could be met on the basis of local butchers and meat retailers. In the years represented by the earlier maps this condition existed. The first real pressure for a distribution of meats away from the center of population and not in the direction of the export trade, came when the "forty-niners" and other western pioneers requiring outfitting for their trips into the plains and mountain country. The most vital changes from an economic standpoint, however, followed the Civil War. It will be noted that previous to the Civil War the centers of production were scarcely more than 300 miles from the center of population. By 1860 all of the centers were definitely to the west of the center of population, although the center of dairy cattle production showed a decided tendency to remain close to the human center.

In 1870 the effects of land settlement following the war had not yet begun to affect the distances to market, although the center of beef cattle in Missouri was decidedly removed from the center of population in Ohio. Ten years later the centers of production of meat animals had distinctly pulled away from the mean point of population. It was about this time that the factors which really separated those businesses which ultimately assumed the scope of national packing companies, from those which continued to supply local markets, began to develop. The period from 1880 to 1890 was a period of expansion in the packing business, and likewise one of westward movement of production and increasing distances between the different centers. The following decade saw the distances become even greater as the center of population remained practically stationary, and sheep and beef

production found their pivot points in Nebraska and Kansas respectively.

National and Local Packers

The division of the packing industry into the two classes of national and local packers has a very real foundation. It is economic rather than arbitrary. The two classes are non-competitive, except with respect to rather narrowly defined markets. The national packing companies have based their service on the transportation of the surplus in one section of the country to regions primarily deficient in meat production. Such companies can compete with local packers operating in the meat-deficient regions only when their volume and efficiency of production are sufficient to offset the closeness of the local packer to his market. It is purely a question of balancing the efficiency, based on volume and utilization of all products of the animal, against the differential caused by railroad rates. If a plant operated by one of the national packers is located in the same town as a plant operated by a local packer, it is rarely possible for the larger packer to buy his livestock and sell his meat on the same margin in the immediate town, because the larger packer must maintain a force capable of handling the selling and accounting necessary to continue interstate trade. On the other hand, as one removes three or four towns distant from the killing point, it becomes increasingly difficult for the local packer to compete, and there is nearly always a definitely marked border, sometimes 100 miles, sometimes 300 miles distant from the point of slaughter, beyond which the local packer is completely at a disadvantage.

It was because the national packer was able to develop in this way that the increasing distances between the centers of population and centers of production developed, and the maps reproduced in previous chapters measure historically what the rate of this development during the last nine decades has been.

New Tendencies

The spread of the packing industry over the whole country in the last 30 years brought about a change more recently that is at the present time resulting in several remarkable and fundamental new tendencies which may make the future development of the industry proceed along lines undreamed of a decade ago. The first feature to be noted as a result of the rapid expansion of the meat packing industry is the movement for the building of co-operative packing plants. In this movement the definite inspiration has been the success of the Danish bacon factories which started about 1888 as a result of the cutting off of the German market for hogs through the erection of a tariff wall, making necessary the packing of pork products at home.³

In the middle nineties in several places in the United States the farmers became interested in the establishment of farmers' co-operative pork packing syndicates. One of the schemes was to form a joint stock company of all the livestock breeders within a radius of 25 miles to build a pork packing plant and to share the profits pro rata. In this way they hoped to get better prices for their hogs, and to save considerably in freight transshipment and charges of middlemen. If the producer could become the manufacturer of the finished product he would get in addition the middleman's profit, it was argued. Many of these schemes, however, were unsuccessful because the farmers were apt to neglect their more important occupation, namely, hog raising.⁴

Co-operative Packing Plants

Now it is true that the larger packing companies keep meat going from a surplus to a deficit area,⁵ and they are able to do this with several plants scattered over the country. On the other hand, it seemed clear that in a region where

³ *The National Provisioner* (July, 1897), Vol. XVII, No. 5; and Hibbard, B. H., *Marketing Agricultural Products*, pp. 333-338.

⁴ Holman, Charles W., *Cooperative Packing Plants*, The National Agricultural Organization Society, Madison, Wis.

⁵ *Armour Handbook of Agriculture*, January, 1921.

livestock was plentiful there was a field for local co-operative packing plants. However, while there have been a very few examples of success, for the most part co-operative packing companies have been failures. This has been due to several causes. The fundamental trouble with many of the "co-ops," as they are called, is that they attempt to succeed as one-line packers. But there is not enough room in the market for any but a general packinghouse as an independent concern. The pork house developed a general business as an economic necessity. The exclusive beef house found it impossible to struggle alone, dissociated from other meat products. This is true whether of co-operatives or others. The general trader outpaced the special trader.⁶

A small packinghouse near the centers of production is not likely to succeed. There are the problems of poor labor supply, and of poor shipping facilities, with only one or two railways. There are not enough buyers to make the plant attractive to shippers. There is no local market, so that it becomes necessary to make a market, and that requires a selling organization. Finally there is not enough volume to utilize by-products which cannot be done to the best advantage without volume.

Other causes that can be assigned are poor management; lack of capital; sometimes the taking over of a poor plant; the promotion of a stock jobbing proposition instead of a legitimate packing business; the lack of a selling organization; the lack of technical knowledge. The outlook for the practical success of the co-operative packing plant movement is not bright.⁷

Management Decentralization

The co-operative movement has been of significance, however, in the change in direction through which the packing industry is passing at the present time, for back of the co-

⁶ *The National Provisioner* (Feb., 1904), Vol. XXX, No. 6.

⁷ This is the view held also by Professor Hibbard.

operative packing plant in local centers is the idea that there is a necessary function for the locally autonomous plant at strategic local centers, in the complicated network of the national meat industry. In other words, the process of developing a national distribution system by a few large companies which has resulted in highly centralized industrial organizations has already reached the height of its efficiency. The idea has begun to take hold on some of the forward-looking minds in the packing business that centralization can be carried too far and that in some ways the limit may have been reached. There may now be necessary a process of decentralization to a certain extent to meet the needs of the industry, just as in a previous epoch there had been necessary a process of centralization. In this new movement there is both co-operation and a certain decentralization, at least in management.

The new emphasis on the fact that regional packing plants have just as important a function to perform in the meat industry as the national organizations is reflected in recent figures on meat animals slaughtered in the United States. *The National Provisioner* pointed this out editorially in the following:⁸

Since the war an interesting change in the percentages of slaughter by the larger and smaller packers has been taking place. The fact is that in the last few years the smaller packers have been increasing their percentage of slaughter. On the other hand, the larger ones have been decreasing their percentage somewhat, according to the records of the Federal Meat Inspection Service.

The exact figures show that while the five largest packers slaughtered 65.1 per cent of the meat animals killed under government inspection in 1917, in 1921 their total had dropped to 53.4 per cent. For the year 1921, the five largest packers slaughtered only about 36 per cent of the animals killed in the country, including government inspected and non-inspected plants.

⁸ *The National Provisioner* (Feb. 3, 1923), Vol. LXVIII, No. 5, p. 27.

One phase of this involves, as has been intimated, a change in management methods in favor of greater autonomy for local plants. An example of the new emphasis on local management is shown in the policy of some of the larger packers and in the growth of such a company as the Allied Packers, Inc. This company, formed two or three years ago, is the result of a new firm taking over the plants of many old and well-established packing companies in different sections of the country, such as Chicago, Detroit, Buffalo, Wheeling, Richmond, and Topeka. A number of the former owners of plants purchased by the Allied Packers retain substantial interests in the new organization and are active managers of their former individually owned plants, thus preserving a large measure of local autonomy. For example, in 1922 Allied Packers bought the plant of the Western Packing and Provision Company at Chicago, one of the largest meat packing plants in the United States, and the former general manager of that company is now vice-president and general manager of the Chicago plant. By the acquisition of this company's plants Allied Packers gained in economy and efficiency. The component concerns in the corporation are the heaviest hog buyers in the industry. Recently they have bought most of their hogs at Chicago, shipping them alive to their various plants. With the acquisition of the Western Packing and Provision Company's plant, slaughter is done at Chicago, the carcasses are placed in refrigerator cars when animal heat has been eliminated, and the product rushed to eastern distributing points.

The Allied Packers' form of organization escapes the burden of heavy overhead expenses, for it has a comparatively small office force at the head offices in Chicago. This central office acts as a central source of information and serves in a consulting capacity rather than as the directing head for details of the actual operation, each of the various plants having its own problems of operation, due to special location and market conditions. The plants are located at

strategic points and large operating autonomy is allowed. In this way all the advantages of the large centralized organization are preserved so far as information is necessary for holding a national market, and at the same time the personal interest and local pride that makes the small organization within a given region a success. However, there must be noted this difference between the Allied Packers and the larger packers. The Allied Packers' individual plants do not have the distribution machinery necessary for long-distance marketing, though as an organization the concern has a national market. The individual plants, therefore, escape this distribution problem of expense.

Co-operation in Meat Industry

The movement just described has in turn been made possible because of another movement which sums up the work that the meat packing industry is developing today. It also gives a picture of the meat packers' relations among themselves and to the public that is indispensable to a proper understanding of the meat industry. It is the co-operative movement that stretches all the way from the producer of livestock to the retailers of meat.

The beginnings and origin of co-operation in the meat packing industry go back a good many years. As has been noted in earlier chapters there were associations of pork packers in the seventies and eighties of the last century, but they had died out by the beginning of the twentieth century. However, in 1906, for the purpose of advancing the interests of the meat trade in general, and to maintain standards, among other ways, through co-operating with the United States Department of Agriculture in the indorsement and enforcing of the recently passed Federal Meat Inspection Act, there was formed the American Meat Packers' Association through the efforts of *The National Provisioner*. The membership included active members, such as slaughterers

of livestock and curers of joints, and associate members, such as sausage, glue, soap and fertilizer makers, renderers, machinery and supply houses, brokers, etc. The first convention of this association of meat packers was held in Chicago in October, 1906.⁹

American Meat Packers' Association

The American Meat Packers' Association did a great deal of good work for the meat packing industry. It occupied an essential stage in the development of the industry. It rendered indispensable service in bringing packers together for interchange of experience and for communal efforts in certain directions. It made a unit of the packing industry. As a trade association it paved the way for later developments of wider scope.

Following the war in 1919, however, it was felt by many men in the meat packing industry, that it was necessary to "bring about a clearer understanding of the economic place that the packing and allied industries hold in the life of the nation and how they may function to the mutual good of the industry of agriculture and the country at large." With that larger aim in view there was established by reorganization of the American Meat Packers' Association in July, 1919, the Institute of American Meat Packers, which held its first annual convention at Atlantic City about two months later and of which Thomas E. Wilson, president of Wilson and Company, was elected president. The detailed aims of the new organization were stated in the constitution to be:

1. To secure co-operation among the meat packers of the United States in lawfully furthering and protecting the interests and general welfare of the industry.

⁹ Officers were elected as follows: president, General Michael Ryan, Cincinnati Abattoir Co., Cincinnati; vice-president, John J. Felin, John J. Felin Co., Inc., Philadelphia, Pa.; secretary, George L. McCarthy, *The National Provisioner*, New York; treasurer, James L. Garneau, Laux Packing Co., St. Louis, Mo.; executive committee: James S. Agar, Western Packing & Provision Co., Chicago; Matthew Danahy, Danahy Packing Co., Buffalo, N. Y.; C. A. Kerber & Co., Elgin, Ill.; Joseph Allerdice, Indianapolis Abattoir Co., Indianapolis, Ind.; Charles Rohe, Rohe & Brother, New York.

2. To afford a means of co-operation with the federal and state governments in all matters of general concern to the industry.
3. To promote and foster domestic and foreign trade in American meat products.
4. To promote the mutual improvement of its members and the study of the arts and sciences connected with the meat packing industry.
5. To inform and interest the American public in regard to the actual economic worth of the meat packing industry.
6. To encourage co-operation with livestock producers and distributors of meat food products.

Work of Packers' Institute

Much progress has been made in co-operation among all elements of the meat industry as a result of this establishment of the Institute of America Meat Packers. A new era has been inaugurated between 1919 and 1922. In 1919 the relations between livestock producers and packers were such that it was found impossible for the Institute to discuss with the producers of livestock, problems common to themselves and to the packing industry. In 1921 and 1922 officers and members of the Institute received many invitations to address associations of livestock producers. Further, at the Convention of the American National Livestock Association at Colorado Springs in January, 1922, the Institute representing the meat packing industry was invited to participate with the leading livestock associations in forming and conducting the National Livestock and Meat Board, which has for its purpose the education of the public in the value of meat in the diet, looking to increased consumptive demand and the undertaking of adequate scientific research in meat. The initial funds are being provided by a fee of 5 cents collected from both buyer and seller of each car of livestock sold at public livestock markets.

Packer and Retailer Co-operate

The co-operation movement, however, includes more than that of packers with producers. Co-operation with the great body of distributors of packinghouse products was seen to be necessary to increase the efficiency of the meat industry. In fact the conception regarding the industry has grown until it embraces the whole meat industry. In 1919 the meat packing industry as such had no relations with those who distributed most of its products. By 1922 packers and a large proportion of the 124,000 or more meat retailers in the United States, due to the initiative of the Institute, were co-operating vigorously in local meat councils to provide better merchandising, increased consumption, and more cordial trade relations.

These meat councils are organized:

1. To promote and encourage the adoption of better merchandising methods in the distributing of meat products, with a view to effecting savings that may be passed on to the consumer in lower prices—a policy which will lead, it is hoped, to increased consumption of meat, and hence to better and sounder business for producers and distributors of meat.
2. To bring about improved relations between packers and retailers.
3. To acquaint the public with the facts about the meat industry.

Each of the meat councils is made up of an equal number of members representing retail meat dealers, members representing packers, with one or two representatives of the public. For example, in the Meat Council of Chicago the 12 retailer members represent 1,500 meat retailers and the 12 packer delegates represent all the Chicago members of the Institute.

Meat Council Progress

To co-ordinate the activities of local meat councils on a national scale the National Association of Meat Councils has

been formed, which makes possible by joint effort, accomplishments that might be too pretentious for any one group. It is expected that important results will come about in the way of more rapid movement of sluggish cuts of meat and in the way of improved merchandising, as a consequence of this packer-dealer co-operation. Already, the National Association of Meat Councils is working with the Bureau of Business Research of Northwestern University, and the United States Department of Agriculture in preparing a simple uniform system of cost accounting for retail meat dealers, which will make for greater efficiency in meat distribution and lower costs for the consuming public.

At the present time the Institute of American Meat Packers is doing a highly important work of international scope for the industry through its various committees. Some of these committees are: the Committee on Packinghouse Practice, the Committee to Confer with Retail Dealers and Trade Associations, the Committee on Public Relations, the Committee on Industrial Relations, the Committee to Confer with Government Officials, the Committee on Local Deliveries, the Committee on Standardized Containers, the Committee on Standardized Cost Accounting, the Traffic Committee, the Committee on Improved Livestock Breeding, the Committee on Bruised and other Livestock Handling Losses, the Committee on Eradication of Livestock Diseases, the Committee on Nutrition and others.

Plan for Future Development

Despite all that is being done the present trend of the industry's development shows shortcomings that require remedy. These are revealed by a study of the methods by which at present the packing industry builds up and renews its personnel, develops its human material, and passes along its cumulative experience to a new generation. Until now there has been among the many hundred packing companies in the

country a great deal of duplication of research work, and a financial limitation upon research. The development of each company has been limited to its own experience, and no one company has its industrial experience systematized. There is only one notable book on packinghouse practice,¹⁰ to say nothing of a practical bibliography of the largest industry in the United States. Many departmental executives have specialized too closely. There is no educational feeder of trained men.

It is to remedy this situation that a development plan for the future of the Institute of American Meat Packers has been proposed by its president, Thomas E. Wilson, which shows high qualities of industrial statesmanship. This plan in one sentence proposes the creation at Chicago of a great national educational institution, offering specialized collegiate instruction to young men intending to enter the packing industry and extension and correspondence courses to men already engaged in the industry; a technical research institute; and an industrial museum.

J. Ogden Armour, Oscar G. Mayer, L. F. Swift, Edward Morris, J. C. Dold, S. T. Nash, E. A. Cudahy, Jr., A. T. Rohe, Arthur Meeker, Howard R. Smith, and other prominent meat packers in various parts of the United States were appointed in 1922 as committee members of a Plan Commission, created to develop a detailed program and ways and means of accomplishing it, which was approved by the entire Institute membership at its convention in October, 1922.

Scope of Institute Plan

Describing this development plan which he proposed, Mr. Wilson said in part:

In my opinion, the Institute ultimately should become an organization which shall be a combined trade association, industrial museum, research institute and educational institution.

1. As an educational institution it should do at least three things:

¹⁰ The Packers' Encyclopedia, published by *The National Provisioner*, 1922.

- (a) Provide broad but specialized collegiate education for young men intending to enter the packing industry, just as the Colorado School of Mines provides such training for young men expecting to begin their work in the mining industry.
 - (b) Furnish special training to intermediate sub-executives (prospective departmental heads) of promise, already engaged in the industry.
 - (c) Conduct a continuation school for plant employees and junior office help.
2. As a research institution, it should:
- (a) Develop and systematize a body of scientific and practical data for the service of the whole industry.
 - (b) Carry on agreed researches into new scientific and practical problems common to all packers, without infringing on research along individual lines being done by specific companies.
 - (c) Conduct experiments on the extension of products and reclamation of materials (except where such experiments would infringe on original work done by some individual company).
 - (d) Collate and disseminate information concerning discoveries and developments having relation to the packing industry, without invading material developed by particular companies.
 - (e) Conduct merchandising surveys and commercial research work.
 - (f) Discover waste and means of eliminating it.
 - (g) Test materials and equipment offered to the industry.
3. As a trade association, it should continue to do what the Institute is now doing in this direction.
4. As an industrial museum, it should provide space for permanent exhibits of models showing modern packinghouse operations, specimens and processes; and it should rent out space for exhibits of materials of industrial value, and for a permanent exhibit of packinghouse machinery and supplies—a sort of scientific museum and centralized market place, a gigantic permanent show window, conveniently located (being at Chicago), where packers from all parts of the country may come and view samples before making purchases and instalments.

A New Era Opening

The plan outlined above is already being put into operation and with it will be completed in fundamentals the remarkable organization changes that have been going on in the meat industry, both in the distribution and production phases, since the end of the Great War. A new period is beginning in what is, perhaps, the most typical of American industries. Meat packers are no longer regarded merely as large-scale butchers, but as efficient industrialists performing an intricate service in a scientific way. The little cross-roads slaughter house, dumping its by-products through a hole in the floor to the hogs beneath, has become one of the largest industries in America, serving the nation, serving the world, and serving them well. Through the Institute this service has not only been improved, but made understood.

The prestige and dignity of the meat industry is now greater than at any other time. It is recognized as one of the most scientific and highly developed industries in the world. With this development has come a feeling of public service through co-operation. This service is now better understood by the public and by those from whom the packers buy their raw materials as well as by those to whom they sell their products. In the words of the president of the Institute of American Meat Packers, "The meat and livestock industry from producer to consumer has now been knitted together for more effective public service." Its future and that of this country are one.

APPENDIX

BIBLIOGRAPHY

CHAPTER I

- American Husbandry. London, 1775.
- Barber, John Warner. History Collections. Worcester, 1839.
- Benton, Elbert J. The Wabash Trade Route in the Development of the Old Northwest. (Johns Hopkins University. Studies in Historical and Political Science. Series XXI, Nos. 1-2.) Baltimore, 1903.
- Beverley, Robert. The History of Virginia. London, 1722.
- Bolles, Albert S. Industrial History of the United States. Norwich, Conn., 1879.
- Brown, Abram E. Faneuil Hall and Faneuil Hall Market. Boston, 1900.
- Bruce, Philip A. Economic History of Virginia in the 17th Century. 2 vols. New York, 1896.
- Carver, Thomas N. Principles of Rural Economics. Boston, 1911.
- Channing, Edward. A History of the United States. Vol. 1. New York, 1909.
- Chastellux, Francois Jean, Marquis de. Travels in North America in the Years 1780, 1781, and 1782. 2 vols. New York, 1827.
- Coxe, Tench. A View of the United States of America. Philadelphia, 1799.
- DeVoe, Richard. Abattoirs. New York, 1865.
- The Market Book. 2 vols. New York, 1862.
- Doyle, John A. English Colonies in America. New York, 1889.
- Dwight, Timothy. Travels in New England and New York, 1796-1815. New Haven, Conn., 1821-22.
- Force, Peter. Tracts and other papers relating principally to the origin, settlement, and progress of Colonies in North America. 4 vols. Washington, 1836-46.
- Gregg, Alexander. Old Cheraws. New York, 1867.
- Hawks, Francis L. History of North Carolina. Fayetteville, N. C. 1858.
- Hutchinson, Thomas. The Diary and Letters of His Excellency, Thomas Hutchinson. Compiled by P. O. Hutchinson. 2 vols. Boston, 1884-86.

- Innes, John H. *New Amsterdam and Its People*. New York, 1902.
- Johnson, Edward. *Wonder Working Providence, 1628-51*. Ed. by W. F. Poole. Andover, Mass., 1867.
- Judd, Sylvester. *History of Hadley*. Springfield, Mass., 1905.
- Kalm, Per. *North America*. 1748.
- La Rochefoucauld Liancourt, Francois Alexandre Frederic, Duc de. *Travels through the United States of America, 1795, 1796, and 1797*. 2 vols. London, 1799.
- Logan, John Henry. *A History of the Upper Country of South Carolina from the Earliest Periods of the War of Independence*. Charleston, S. C., 1859.
- Milay, G. A. *Topographical Description of the Western Territory of North America*. New York, 1793.
- New York. Department of Agriculture. *Report*. Albany, N. Y., 1843.
- Oberholtzer, Ellis Paxson. *Philadelphia; a History of the City and Its People*. Philadelphia, 1912.
- O'Callaghan, Edmund Bailey. *History of New Netherland*. 2 vols. New York, 1848.
- Penn, William. *Further Account of the Province of Pennsylvania and Its Improvements*. London, 1685.
- Pitkin, Timothy. *Statistical View of the Commerce of the United States of America*. New York, 1817.
- Pooley, William Vipond. *The Settlement of Illinois from 1830 to 1850*. Madison, Wis., 1908.
- Sanders, Alvin H. *Shorthorn Cattle*. Chicago, 1918.
- Scharf, John T., and Westcott, Thompson. *History of Philadelphia, 1609-1884*. Philadelphia, 1884.
- Schoepf, Johann D. *Travels in the Confederation, 1783-84*. Philadelphia, 1911.
- Smiley, Jerome C. *Prose and Poetry of the Livestock Industry of the United States*. Denver, 1905.
- Smyth, John F. D. *A Tour in the United States of America*. 2 vols. London, 1784.
- Thompson, J. W. *A History of Stock Raising in America from Earliest Colonial Times to the Present (1607-1916)*. (Unpublished.)
- Thwaites, Reuben Gold. *Daniel Boone*. New York, 1902.
- Turner, Frederic Jackson. *The Old West*. Madison, Wis., 1909.
- U. S. Department of Agriculture. *Report 1866-67*. Washington, D. C.
- U. S. Patent Office. *Report, 1854*. Washington, D. C.
- Weeden, William B. *Economic and Social History of New England, 1620-1789*. 2 vols. Boston, 1890.

- Williamson, John. History of North Carolina. 2 vols. Philadelphia, 1812.
- Winthrop, John. History of New England from 1630-99. Boston, 1908.

CHAPTERS II-VI

- Andreas, Alfred T. History of Chicago. 3 vols. Chicago, 1884-86.
- Annual Report of Pork Packing in the West. Cincinnati, 1849-86.
- Armour, Jonathan Ogden. The Packers, the Private Car Lines and the People. Philadelphia, 1906.
- Armour, Philip D. The Packing Industry. (One Hundred Years of American Commerce. Ed. by Chauncey M. Depew. Vol. II, pp. 383-88.) New York, 1895.
- Baird, Robert. View of the Valley of the Mississippi. Philadelphia, 1832.
- Beef Making on Eastern Farms. (The National Provisioner. Vol. XXXIV, No. 8, p. 37.) New York, Feb. 24, 1906.
- Blanchard, Rufus. Discovery and Conquests of the Northwest, with the History of Chicago. Wheaton, Ill. 1879.
- Bolles, Albert. Industrial History of the United States. Norwich, Conn., 1879.
- Bradbury, John. Travels in the Interior of America in 1809, 1810, and 1811. Liverpool, 1817.
- Brighton Cattle Market. (Country Gentleman, Vol. XVI, No. 6, p. 100.) Philadelphia, Aug. 9, 1860.
- Chicago. Board of Trade. Report. Chicago, 1858-72.
- Chicago Tribune. Annual Review of Trade and Commerce. 13 vols. Chicago, 1854-74.
- Cist, Charles. Cincinnati in 1841. Cincinnati, 1841.
- Cincinnati in 1851.
- Cincinnati in 1859.
- The Cincinnati Miscellany. 2 vols. Cincinnati, 1845.
- Clay, John. The Work of the Breeder in Improving Livestock. (U. S. Department of Agriculture. Yearbook. 1899. pp. 627-44.) Washington, D. C., 1900.
- Cleaver, Charles. History of Chicago from 1833 to 1892. Chicago, 1892.
- Colbert, Elias. Chicago. Chicago, 1868.
- Curtiss, Daniel S. Western Portraiture and Emigrants' Guide. New York, 1852.
- Drake, Benjamin, and Mansfield, E. D. Cincinnati in 1826. Cincinnati, 1827.
- Drake, Daniel. Natural and Statistical View, or Picture of Cincinnati and the Miami Country. Cincinnati, 1815.

- Driving Cattle over the Mountains. (National Live Stock Journal. Vol. VI, No. 8, p. 302.) Chicago, Aug., 1875.
- Edwards, Richard, and Hopewell, Menra. *Edward's Great West and Her Commercial Metropolis*. St. Louis, 1860.
- Faux, William. *Memorable Days in America*. London, 1823.
- Fearon, Henry B. *Sketches of America*. London, 1819.
- Flint, Timothy. *History and Geography of the Mississippi Valley*. Cincinnati, 1832.
- Ford, Thomas. *History of Illinois from its Commencement as a State in 1818 to 1847*. Chicago, 1854.
- Fordham, Elias P. *Personal Narrative of Travels in Virginia, Maryland, Pennsylvania, Ohio, Indiana, Kentucky, and Residence in Illinois Territory, 1817-18*. Cleveland, 1906.
- Fraser, John Foster. *America at Work*. London, 1905.
- Garfield, James R. *The Beef Industry*. (LaFollette, Robert M.: *The Making of America*. Vol. V, pp. 174-93.) Chicago, 1906.
- Griffiths, E. *Griffiths' Annual Review of the Live Stock and Produce Trade*. Chicago, 1876.
- Griggs, S. C. *Chicago Pictorial Advertiser and Illustrated Business Directory*. 1858.
- Hall, James. *Letters from the West*. 1828.
- *Notes on the Western States*. Philadelphia, 1838.
- *The West; Its Commerce and Navigation*. Cincinnati, 1848.
- Hamilton, Henry E. *Gurdon S. Hubbard*. Chicago, 1888.
- Hasse, Adelaide R. *Index of Economic Material in Documents of the States of the United States; Illinois, 1809-1904*. Washington, 1909.
- Hazard, Samuel. *United States Commercial and Statistical Register*. Vol. V. Philadelphia, 1841.
- History of Adams County, Illinois*. Chicago, 1879.
- History of Madison County, Illinois*. Edwardsville, Ill., 1882.
- History of Madison County, Ohio*. Chicago, 1883.
- History of Mercer County*. (Containing also a Short History of Henderson County.) Chicago, 1882.
- History of Peoria County, Illinois*. Chicago, 1880.
- Hoffman, Charles F. *A Winter in the West; letters descriptive of Chicago and Vicinity in 1833-34*. Chicago, 1882.
- Houstoun, Mrs. Mathilda C. Fraser. *Hesperos, or Travels in the West*. London, 1850.
- Hubbard, Gurdon S. *Early Chicago and Illinois History*. (Chicago Historical Society Collections, Vol. IV.) Chicago, 1890.
- Hunt's Merchants Magazine and Commercial Review*. Vols. 1-66. New York, 1839-72.

- Illinois State Agricultural Society. Transactions. Vols. 1-8, Springfield, Ill., 1853-70.
- Kirkland, Joseph. The Story of Chicago. Chicago, 1892-94.
- Loomis, Silas L. Distribution and Movement of Neat Cattle. (U. S. Department of Agriculture. Report, 1863. pp. 248-64.) Washington, D. C., 1863.
- Lyford, W. G. The Western Address Directory. 1837.
- McCarty, Harry C. Slaughtering and Meat Packing. (U. S. Department of the Interior. 12th Census. Report. Vol. IX, Pt. III, pp. 385-429.) Washington, D. C., 1902.
- Mackay, Charles. Life and Liberty in America. London, 1859.
- McMaster, S. W. Sixty Years on the Upper Mississippi. Rock Island, Ill., 1893.
- Martineau, Harriet. Retrospect of Western Travel. New York, 1838.
- Melish, John. Travels in the United States of America in 1806, 1807 and 1809, 1810 and 1811. Philadelphia, 1812.
- Mitchell, S. A. Illinois in 1837. Philadelphia, 1837.
- Norris' Chicago Directory. Chicago, 1844.
- Oberstolz, Henry. The City of St. Louis. St. Louis, 1880.
- Peck, Rev. John Mason. New Guide for Emigrants in the West. Boston, 1837.
- Perrin, William H. History of Cass County, Illinois. Chicago, 1882.
- Perry, George Powell. Wealth from Waste. New York, Chicago, 1908.
- Plumb, Charles S. Types and Breeds of Farm Animals. Boston, 1920.
- Pooley, William Vipond. Settlement of Illinois from 1830 to 1850. Madison, Wis., 1908.
- Poor's Manuals of the Railroads of the United States. New York.
- Porter, Robert P. The West; from the census of 1880. Chicago, 1882.
- Powell, Lyman P. Historic Towns of the Western States. New York, 1901.
- Prairie Farmer. Chicago, 1841-62.
- Scharf, John T. History of St. Louis City and County. Philadelphia, 1883.
- Snyder, John T. Adam W. Snyder and his Period in Illinois History, 1817-42. Springfield, Ill., 1903.
- Stevens, George E. The Queen City in 1869, The City of Cincinnati. Cincinnati, 1869.
- Stevens, Walter B. St. Louis the Fourth City. 3 vols. St. Louis, 1909.
- Taylor, Jacob N. Sketch Book of St. Louis. St. Louis, Mo., 1858.

- Thomas, Jesse B. Statistics concerning the City of Chicago. Report of Hon. Jesse B. Thomas as a Member of the Executive Committee Appointed by the Chicago River and Harbor Convention, 1847. (Fergus' Historical Series, No. 28.) Chicago, 1882.
- Turner, Frederick J. Rise of the New West, 1819-29. New York, 1906.
- Union Agriculturist and Prairie Farmer, Vol. 1 (afterwards "Prairie Farmer"). Chicago, 1841.
- U. S. Department of Agriculture. Report. 1854, 1855, 1861, 1863. Washington, D. C.
- U. S. Department of the Interior. Census Office. Agriculture of the United States in 1860. pp. cxxix-cxxxiv. "Cattle and Cattle Trade of the West." Washington, D. C. 1864
- U. S. Senate. 51st Congress, 1st Session. Report. Vol. 3, Nos. 644-829. Transportation and Sale of Meat Products. Washington, 1889-90.
- U. S. Treasury Department. Bureau of Statistics. Monthly Summary. Washington, D. C., February, 1900.
- Wild, J. C. Valley of the Mississippi. St. Louis, Mo., 1841.

CHAPTER VII

- Forbes, B. C. Right Organization Essential Says Thomas E. Wilson. (Forbes Magazine, Vol. 10, No. 4, pp. 169-70.) New York, May 27, 1922.
- Goodspeed, Thomas W. Gustavus Franklin Swift. (University Record, Vol. VII, No. 2, pp. 90-116). Chicago, University of Chicago Press, April, 1921.
- Gunsaulus, Frank W. Philip D. Armour. (American Review of Reviews, Vol. 23, pp. 167-76.) New York, Feb., 1901.
- Heller, L. L. Packers are People. (Field Illustrated. Vol. 28, pp. 559-63.) New York, Aug., 1918.
- This is a series of brief biographical sketches of pioneer packers.
- Hubbard, Elbert. Philip D. Armour. (Little Journeys to the Homes of Great Business Men. Book I, pp. 149-94.) East Aurora, N. Y., 1909.
- The National Provisioner. New York and Chicago.
- This is the chief source for biographical material on the meat packers of the country. It is the official business paper of the meat industry, and the leading periodical in its field in the world.
- Warren, A. Philip D. Armour. (McClure's Magazine. Vol. 2, No. 3, p. 260.) New York, Feb., 1894.
- Wentworth, Edward N. The Portrait Gallery of the Saddle and Sirloin Club. Chicago, 1920.

CHAPTER VIII

- Aldridge, Reginald. *Life on a Ranch; Ranch Noted in Colorado, Indian Territory, and Northern Texas.* New York, 1884.
- Allen, A. B. *Beef and Bullocks.* (Harper's Magazine. Vol. LXI, pp. 93-7.) New York, June, 1880.
- Barker, Robert M. *The Economics of Cattle Ranching in the Southwest.* (American Review of Reviews, Vol. 24, No. 3, pp. 305-13.) New York, Sept., 1901.
- Baumann, John. *On a Western Ranch.* (Fortnightly Review. Vol. XLVII, pp. 516-33.) St. Louis, Mo., April, 1887.
- Beef; from Ranch to Shambles. (Harper's Magazine, Vol. LXIX, pp. 293-301.) New York, July, 1884.
- Brisbin, James S. *The Beef Bonanza.* Philadelphia, 1881.
- Garland, Hamlin. *A Son of the Middle Border.* New York, 1917.
- Gordon, Clarence. *Report on Cattle, Sheep and Swine Supplementary to Enumeration of Live Stock on Farms in 1880.* (U. S. House Miscellaneous Document 42, Pt. 3. 47th Congress, 2d Session. Report of the Production of Agriculture as Returned at the 10th Census, 1880. pp. 991-1149.) Washington, D. C. 1883.
- Great Britain. *Agricultural Interests Commission. Reports of the Assistant Commissioners.* [Joint Report of Mr. Clare Read and Mr. Albert Pell.] (Sessional Papers of the House of Commons, Vol. 18. [Cd.-2678.] London, 1880.
- Grohman, W. Baillie. *Cattle Ranches in the Far West.* (Fortnightly Review, Vol. XXXIV, pp. 438-57.) St. Louis, Mo. Oct., 1880.
- Hagedorn, Hermann. *Roosevelt in the Bad Lands.* New York, 1921.
- Harger, Charles M. *Cattle Trails of the Prairies.* (Scribner's Magazine. Vol. XI, No. 6, pp. 732-42.) June, 1892.
- Hastings, Frank S. *A Ranchman's Recollections.* Chicago, 1921.
- Hough, Emerson. *The Story of the Cow-Boy.* New York, 1897.
- Jackson, W. H., and Lang, S. A. *The Texas Stock Directory, or Book of Marks and Brands.* San Antonio, Tex., 1865.
- Lomax, John A. *Songs of the Cattle Trail and Cow Camps.* New York, 1920.
- Love, Clara. *Cattle Industry of the Southwest.* (Texas Historical Quarterly. Vol. XIX, No. 4, p. 382.) Austin, Tex., April, 1916.
- McDonald, James. *Food from the Far West.* London, 1878.
- MacEwan, Alice. *The Heraldry of the Plains.* (McClure's Magazine, Vol. 3, No. 2. pp. 100-16.) New York, June, 1894.
- Nimmo, Joseph. *The American Cowboy.* (Harper's Magazine. Vol. 73, p. 880.) New York, Nov., 1886.
- *Report in Regard to the Range and Ranch Cattle Business of the*

United States. (U. S. Treasury Department. Bureau of Statistics. Document 690.) Washington, D. C., 1885.

For review and correspondence regarding above report see *The Nation*, Vol. 41, pp. 15-17, 50-51, 113-14, 172-74. New York, July 2, 16; Aug. 6, 27, 1885.

Paxson, Frederic L. *The Cow Country*. (*American Historical Review*. Vol. 22, pp. 65-82.) New York, Oct., 1916.

Shepherd, William. *Prairie Experiences in Handling Cattle and Sheep*. New York, 1885.

Smiley, Jerome. *Prose and Poetry of the Livestock Industry in the United States*. Kansas City, 1904.

U. S. Congress. House. Executive Document 46. 46th Congress, 2d Session. Report of the Land Commission. Washington, D. C., 1880.

— Executive Document 47, Pt. 2. 46th Congress, 3d Session. Laws . . . upon which the Public Land Titles in each State and Territory Have Depended. Washington, D. C., 1881.

— Executive Document 1, Pt. V. 47th Congress, 1st Session. Report of the Secretary of the Interior. Land Office. Washington, D. C., 1881.

— Executive Document 232. 50th Congress, 1st Session. *Cattle Grazers on Public Lands*. Washington, D. C., 1889.

U. S. Department of Agriculture. Yearbook, 1921. "Our Beef Supply." Washington, D. C., 1922.

— Bureau of Animal Industry. *Meat Situation in the United States*. Washington, D. C., 1916.

Pt. I. Holmes, G. K. *Statistics of Livestock, Meat Production and Consumption Process and International Trade for Many Countries*. Pt. II. Barnes, W. C. *Live Stock Production in the Eleven Far Western Range States*. Pt. III. Cotton, J. S. *Methods and Cost of Growing Beef Cattle in the Corn Belt States*. Pt. IV. Ward, W. F., and Ray, S. H. *Utilization and Efficiency of Available American Feed Stuffs*. Pt. V. Hall, Louis D., Simpson, F. M., and Doty, S. W. *Methods and Cost of Marketing Live Stock and Meats*.

Vollweiler, Albert T. *Roosevelt's Ranch Life in North Dakota*. (University of North Dakota. *Quarterly Journal*. Vol. 9, No. 1, pp. 31-49.) University, N. D., Oct., 1918.

Von Richthofen, W. B. *Cattle Raising on the Plains of North America*. New York, 1885.

Where the Meat Comes From. (*Lippincott's Magazine*, Vol. XXIV, pp. 573.) Philadelphia, Nov., 1879.

CHAPTER IX

- Angell, George T. *Cattle Transportation in the United States*. Boston, 1872.
- Bancroft, H. H. *History of Washington, Idaho and Montana, 1845-1889*. San Francisco, 1890.
- Cattle Growers' Interstate Executive Committee. *The Transportation Tax Wrongs and a Remedy*. Denver, 1904.
- Chapin, Robert M. *The Hygiene of the Transportation of Animal Food Products by Rail, Boat and Wagon in the United States*. (15th International Congress of Hygiene and Demography. Transactions. Vol. V, Pt. I., pp. 121-28.) Washington, D. C., 1912.
- Downing, James E. *Pioneer Transportation for Live Stock*. (Breeder's Gazette. Vol. LXXX, No. 8, pp. 249-50.) Chicago, Aug. 25, 1921.
- Goding, Henry, and Raub, A. Joseph. *The Twenty-Eight Hour Law Regulating the Interstate Transportation of Livestock, Its Purpose, Requirements and Enforcement*. (U. S. Department of Agriculture. Bulletin No. 589.) Washington, D. C., Jan. 5, 1918.
- Henry, William A. *Feeds and Feeding*. Madison, Wis., 1910.
- Illinois State Agricultural Society. *Transactions*. Vol. VI. Springfield, Ill. 1865-66.
- Love, Clara M. *History of the Cattle Industry in the Southwest*. (Southwest Historical Quarterly. Vol. 19, pp. 370-99; Vol. 20, pp. 1-8.) Austin, Texas, 1916.
- McCoy, Joseph G. *Historic Sketches of the Cattle Trade of the West and Southwest*. Kansas City, Mo., 1874.
- Macdonald, James. *Food from the Far West*. New York, 1878.
- Massachusetts. Board of Railroad Commissioners. *Report*. Boston, 1871.
- Moody, John. *The Railroad Builders*. (The Chronicles of America Series, Vol. 39.) New Haven, Conn., 1919.
- Mumford, Herbert W., and Hall, Louis D. *Cattle Feeding Conditions in the Corn Belt*. (University of Illinois. Agricultural Experiment Station. Circular. No. 175.) Urbana, Ill., 1914.
- Nimmo, Joseph. *Report in Regard to the Range and Ranch Cattle Business of the United States*. (U. S. Treasury Department. Bureau of Statistics. Document 690.) Washington, D. C., 1885.
- Noyes, Walter C. *American Railroad Rates*. Boston, 1905.
- Poor's Manual of the Railroads of the United States. New York, 1881 and 1889.
- Powell, Cuthbert. *Twenty Years of Kansas City's Live Stock Trade and Traders*. Kansas City, 1895.
- Railway Age. Chicago, Oct. 16, 1903.

- Rusling, James F. *The Railroads! The Stockyards! The Eveners! An Exposé of the Railroad Ring.* Washington, D. C., 1878.
- Smiley, Jerome C. *Prose and Poetry of the Livestock Industry.* Denver, 1906.
- Taylor, Charles H. *History of the Chicago Board of Trade.* Vol. 1. Chicago, 1917.
- Thompson, W. H. *Live Stock Exchanges.* (The National Provisioner. Vol. XXII, No. 5.) New York, Feb. 3, 1900.
- U. S. Department of Agriculture. *Report.* Washington, 1872.
- Bureau of Animal Industry. *Annual Report.* 1st. Washington, D. C., 1884.
- U. S. Department of the Interior. Census Office. *Influence of Railroads on Agriculture.* Washington, 1860.
- U. S. Federal Trade Commission. *Food Investigation. Report on the Meat Packing Industry. Summary and Part I.* Washington, D. C., 1919.
- Vest, G. G. *Transportation and Sale of Meat Products.* (U. S. Senate Report. Vol. 3, No. 829. 51st Congress, 1st Session.) Washington, 1890.
- Ward, William F., and Downing, James E. *The Shrinkage in the Weight of Beef Cattle in Transit.* (U. S. Department of Agriculture. Bulletin No. 25.) Washington, D. C., 1913.
- Weld, Louis D. H. *Private Freight Cars and American Railways.* (Columbia University Studies in History, Economics and Public Law. Vol. XXXI, No. 1.) New York, 1908.

CHAPTER X

- Armour, Jonathan Ogden. *The Packers, the Car Lines and the People.* Philadelphia, 1906.
- Arrowood, Milton W. *Refrigeration, a Practical Treatise.* Chicago, 1917.
- Bergman, Arvid M. *A Review of the Frozen and Chilled Trans-Oceanic Meat Industry.* Uppsala and Stockholm, Almquist and Wiksells, 1916.
- Boyer, Francis H. *Abattoir Refrigeration.* (Ice and Refrigeration. Vol. XX, pp. 33, 65, 120, 196, 230, 264; Vol. XXI, pp. 17, 70, 108, 145, 202, 231.) Chicago, 1901.
- Cooper, Madison. *Practical Cold Storage.* Chicago, 1905.
- Historical Review of the Rise of Mechanical Refrigeration.* (Ice and Refrigeration. Vol. XXI, Nos. 2, 3, 5.) Chicago, Aug., Sept., and Nov., 1901.

- Macintire, Horace J. Principles of Mechanical Refrigeration. New York, 1922.
- Nickerson, J. F. The Development of Refrigeration in the United States. (Ice and Refrigeration. Vol. XLIX, No. 4, pp. 170-75.) Chicago, Oct., 1915.
- Power's Practical Refrigeration. Compiled by the editorial staff of Power. New York, 1921.
- Prospectus of the New York and Texas Beef Packing Co. for Packing Beef in Texas by Means of the Processes Patented by D. E. Somes, of Washington, D. C. Washington, D. C., 1867.
- Russell, Charles E. The Greatest Trust in the World. p. 24. New York, 1906.
- Taylor, Charles H. History of the Chicago Board of Trade. Vol. I, pp. 369-70. Chicago, 1917.
- Tellier, Charles. Histoire d'une Invention Moderne, le Frigorifique. Paris, C. Delagrave, 1910.
- U. S. Federal Trade Commission. Food Investigation. Report on Private Car Lines. p. 26. Washington, 1920.
- Wallis-Taylor, Alexander J. Refrigeration, Cold Storage and Ice Making. 3rd ed. New York, 1912.
- Weld, Louis D. H. Private Freight Cars and American Railways. (Columbia University. Studies in History, Economics and Public Law. Vol. XXXI, No. 1.) New York, 1908.

CHAPTER XI

- Amalgamated Meat Cutters and Butcher Workmen of North America. Official Journal. Syracuse, N. Y., May, 1904. Pp. 110-11.
- Boss, Andrew. Meat on the Farm. (U. S. Department of Agriculture. Farmers' Bulletin. No. 183.) Washington, 1917.
- The Buzzer. House organ, Swift and Company. Chicago.
- Chicago Board of Trade. Secretary's Report, Chicago, 1875.
- Cincinnati Price Current. Cincinnati, 1882-90.
- DeVoe, Richard. Abattoirs. Albany, N. Y., 1866.
- Goodspeed, Thomas W. Gustavus Franklin Swift. (University Record. Vol. VII, No. 2, pp. 90-116.) Chicago, University of Chicago Press, April, 1921.
- Horsford, Eben N. Investigation of the Sources of Offensive Odors. Boston, 1873.
- Hudson, James F. Railways and the Republic. New York, 1886.
- Joint Executive Committee of Eastern Railroads. Proceedings. 1883-84.

- Massachusetts. State Board of Health. The Brighton Abattoir. Boston, 1878.
- Muzzey, Henry W. Argument in Behalf of John P. Squire before the Massachusetts State Board of Health. Cambridge, 1874.
- The National Provisioner. New York and Chicago. 1889 to date.
- New York City. Board of Health. Report of the Sanitary Committee on Concentration and Regulation of the Business of Slaughtering Animals in the City of New York. New York, 1874.
- Nimmo, Joseph. Report in Regard to the Range and Ranch Cattle Business of the United States. Appendix No. 2. (U. S. Treasury Department. Bureau of Statistics. Document 690.) Washington, D. C., 1885.
- Objections to a New Abattoir Company. Boston, 1872.
- The Packers' Encyclopedia. Ed. by Paul I. Aldrich. Chicago, 1922.
- Schouler, Willard C. Cattle Industry of Boston. (New England Magazine. N. S. Vol. 41, No. 3, pp. 328-37.) Boston, Nov., 1909.
- Stiles, Charles W. The Country Slaughterhouse as a Factor in the Spread of Disease. (U. S. Department of Agriculture. Yearbook, 1896, pp. 155-66.) Washington, D. C., 1897.
- Taylor, Charles H. History of the Chicago Board of Trade. Vol. II, p. 729. Chicago, 1917.
- U. S. Department of Agriculture. Bulletin. No. 25. Shrinkage in Weight of Beef Cattle in Transit. Washington, D. C., 1913.
- Yearbook. 1921. Our Beef Supply. Washington, D. C., 1921.
- Bureau of Animal Industry. Annual Report. 1886, pp. 277-82. Dressed Beef Traffic. Washington, D. C., 1887.
- U. S. Federal Trade Commission. Food Investigation. Report . . . on Private Car Lines. June 27, 1919. Washington, D. C., 1920.
- Weld, Louis D. H. Private Freight Cars and American Railways. (Columbia University. Studies in History, Economics and Public Law. Vol. XXXI, No. 1.) New York, 1908.
- Winans, Charles. Evolution of a Vast Industry. Chicago.

CHAPTER XIII

- American National Live Stock Association. Tariff on Live Stock and Meats. A statement setting forth the reasons for the amendment of the pending tariff bill in relation to the meat inspection laws. (U. S. Senate Document 48. 63rd Congress, 1st Session.) Washington, D. C., 1913.
- Australia. Royal Commission on the Meat Export Trade. Report. Melbourne, 1914.

- Bolles, Albert S. *Industrial History of the United States*. Norwich, Conn., 1879.
- Bramlette, Edgar. *Prohibition of American Pork in Germany*. (U. S. Consular Report. Vol. 30, pp. 458-71.) Washington, 1889.
- Chase, Stephen. *Production of Meat in the United States and Its Distribution During the War*. Washington, D. C., 1919.
- Clapp, Edwin J. *Economic Aspects of the War*. New Haven, Conn., 1920.
- Critchell, James T., and Raymond, Joseph. *A History of the Frozen Meat Trade*. London, 1912.
- Elliott, L. Elwyn. *The Cattle Industry in Brazil*. (Pan American Magazine. Vol. 21, p. 316). New York, 1915.
- Ford, Lillian C., and Ford, Thomas F. *The Foreign Trade of the United States*. New York, 1920.
- German Meat Regulations, with original text. (U. S. Department of Agriculture. Bureau of Animal Industry. Bulletin 50.) Washington, D. C., 1903.
- Great Britain. Parliament. House of Commons. Committee on Trusts. *Interim Report on Meat*. London, 1920. (Cd. 1057.)
- Departmental Committee Appointed to Inquire into Combinations in the Meat Trade. *Report*. London, 1909.
- Greg, Isabella M., and Towers, S. H. *Cattle Ships and Our Meat Supply*. London, 1894.
- Hickman, R. W. *The Government's Inspection and Quarantine Service Relating to the Importation and Exportation of Live Stock*. (U. S. Department of Agriculture. Bureau of Animal Industry. Circular 213.) Washington, D. C., 1913.
- Holmes, George K. *Meat Supply and Surplus*. (U. S. Department of Agriculture. Division of Statistics. Bulletin No. 55.) Washington, D. C., 1907.
- International Health Exhibition. *The Health Exhibition Literature*. Vol. V. Craigie, P. G. *The Meat Supplies of this Country*. London, 1884.
- Joss, Edward C. *Meat Production in Australia and New Zealand*. Washington, 1914.
- Killik, Stephen. *The Argentine Meat Trade*. (International Review of Commerce and Industry. Vol. 1, pp. 225-32.) London, 1914.
- Macdonald, James. *Food from the Far West, or American Agriculture, with Special Reference to the Beef Production and Importation of Dead Meat from America to Great Britain*. New York, 1878.
- MacKenzie, Kenneth J. J. *Cattle and the Future of Beef Production in England*. Cambridge, Eng., 1919.

- Meat Trades' Journal and Cattlemen's Gazette. Organ of the British Colonial and Foreign Live Stock and Dead Meat Trade. London, 1888.
- Melvin, Alonzo D., and Rommel, G. M. Meat Production in the Argentine and its Effect upon the United States. (U. S. Department of Agriculture. Yearbook 1914, pp. 381-90.) Washington, D. C., 1915.
- Mitchell, Wesley C., and others. International Price Comparisons. Washington, D. C., 1919.
- Nimmo, Joseph. Report in Regard to the Range and Ranch Cattle. Business of the United States. (U. S. Treasury Department. Bureau of Statistics. Document 690.) Washington, D. C., 1885.
- Norway, Sweden and Russia as Markets for Packinghouse Products. Imports from Principal Countries 1895-1904. (U. S. Department of Agriculture. Bureau of Statistics. Bulletin 41.) Washington, D. C., 1906.
- Pearse, Albert W. The World's Meat Future. London, 1920.
- Plimsoll, Samuel. Cattle Ships. London, 1890.
- Pork Raising as an Industry. Its Future. (National Live Stock Journal. Vol. V, No. 1, pp. 22.) Chicago, Jan., 1874.
- Putnam, George E. Supplying Britain's Meat. London, 1923.
- Rutter, Frank R. Foreign Restrictions on American Meat. (U. S. Department of Agriculture. Yearbook, 1906, pp. 247-64.) Washington, D. C., 1907.
- Salmon, D. E. Report on the Beef Supply of the United States and the Export Trade. (U. S. Department of Agriculture. Bureau of Animal Industry. Special Bulletin.) Washington, D. C., 1890.
- U. S. Department of Agriculture. Report. Washington, 1876.
- Report No. 33. Selected Correspondence Relating to the Export Trade of the United States in Live Stock and Meat Products. Washington, 1893.
- Bureau of Animal Industry. Report. 1906. Washington, D. C.
- Bureau of Statistics. Bulletin 39. Meat in Foreign Markets. Washington, 1905.
- U. S. Senate. Committee on Foreign Relations. Report [to accompany bill S. 1876]. A Report on Senate Resolution of January 22, 1884, concerning such legislation as shall protect our interests against those governments which have prohibited the importation of meats from the United States. Washington, 1884.
- Vest, G. G. Transportation and Sale of Meat Products. (U. S. Senate Report. Vol. 3, No. 829. 51st Congress, 1st Session. Washington, 1890.

- Where the Meat Comes From. (Lippincott's Magazine. Vol. XXIV, pp. 73-79.) Philadelphia, Nov., 1879.
- Winans, Charles. Evolution of a Vast Industry. Chicago.

CHAPTER XV

- Clay, John. The American Cattle Trade. (Breeder's Gazette. Vol. 15, No. 25.) Chicago, June 19, 1889.
- Coleman, Norman J. Dressed Meat Traffic. (U. S. Department of Agriculture. Bureau of Animal Industry. 3d Report, pp. 277-82.) Washington, D. C., 1886.
- Diteweg, George. The Meat Inspection Service of the United States. (U. S. Department of Agriculture. Yearbook 1916, pp. 77-97.) Washington, D. C., 1917.
- Farrington, A. M. The Need of State and Municipal Meat Inspection to Supplement Federal Inspection. (U. S. Department of Agriculture. Bureau of Animal Industry. Circular 154.) Washington, D. C., 1910.
- Henschien, Hans P. Packing House and Cold Storage Construction. Chicago, 1915.
- Institute of American Meat Packers. Packing House Accounting. Pt. II. "Tentative Draft of Proposed Accounting Instructions on the Cattle Business." Chicago, 1920.
- Melvin, A. D. The Federal Meat Inspection Service. (U. S. Department of Agriculture. Bureau of Animal Industry. Circular 125.) Washington, D. C., 1908.
- State and Municipal Meat Inspection and Municipal Slaughterhouses. (U. S. Department of Agriculture. Bureau of Animal Industry. Circular 185.) Washington, D. C., 1910.
- U. S. Bureau of Corporations. Report on the Beef Industry. (Garfield Report.) Washington, D. C., 1905.
- Wilder, Fred W. The Modern Packing House. Chapters III, IV, and V. Chicago, 1905.

CHAPTER XVI

- Andes, Louis E. Vegetable Fats and Oils. London, 1917.
- Armour, Jonathan Ogden. The Packers, the Private Car Lines and the People. Chapter IX. Philadelphia, 1906.
- Blanc, J. Sur les Hemarthroses. (Presse Medicale. Vol. XXIV, p. 523.) Paris, 1916. (Abstract by the Journal of the American Medical Association, May 5, 1917.)
- Brain Lipoid. (Journal, American Medical Association. Vol. LXVII, p. 437.) Chicago, Aug. 5, 1916.

- Burford, Coleman G. Goiter in Children. (Surgery, Gynecology and Obstetrics. Vol. 20, pp. 35-41.) Chicago, Jan., 1915.
- Cecil, H. L. The Use of Kephalin to Hasten Coagulation and Hemostasis after Surgical Operations. (Journal, American Medical Association. Vol. LXVIII, p. 628.) Chicago, Feb. 24, 1917.
- De Loach, R. J. H. By-Products of the Packing Industry. Chicago, 1919.
- Ellis, Carleton. The Hydrogenation of Oils. New York, 1914.
- Emery, James A., and Henley, Robert. Meat Extracts; their Composition and Identification. (Journal of Agricultural Research. Vol. XVII, No. 1.) Washington, D. C., April 15, 1919.
- Fibrin Ferment and Thromboplastic Substance (Kephalin). (New and Unofficial Remedies). Chicago, 1917. p. 126.
- Grotti, Andre. Thyroid and Thymus, pp. 287-90. Philadelphia, 1918.
- The Hemostatic Action of Kephalin. (Journal, American Medical Association. Vol. LXVII, pp. 1373-74.) Chicago, Nov. 4, 1916.
- Hertoghe, E. Thyroid Deficiency. (Medical Record. Vol. LXXXVI. pp. 489-505.) New York, Sept. 19, 1914.
- Hirschfelder, A. D. Brain Lipoid as a Hemostatic. (Science, Vol. XLIV, p. 251.) Lancaster, Pa., Aug. 18, 1916.
- Hoagland, Ralph, McBryde, Charles N., and Powick, Wilmer C. Change in Fresh Meat during Cold Storage above Freezing. (U. S. Department of Agriculture. Bulletin No. 433. Professional Paper.) Washington, D. C., 1917.
- Howell, W. H. The Role of Antithrombin and Thromboplastin (Thromboplastic Substance) in the Coagulation of Blood. (American Journal of Physiology. Vol. 29, pp. 187-209.) Boston, 1911-12.
- Institute of American Meat Packers. How By-Products are Utilized. (The Producer, Vol. IV, Nos. 7-8.) Denver, Dec., 1922, and Jan., 1923.
- International Library of Technology. 19 B. Pt. II. Packing House Industries. Scranton, Pa., 1905.
- Lamborn, Leebeert L. Modern Soap, Candles and Glycerin. New York, 1906.
- Lemel, N. J. Article in *Nederlandsch Tijdschrift voor Geneeskunde*, No. 4, pp. 241-308. Amsterdam, The Netherlands. Abstract in *Journal, American Medical Association*, Jan. 5, 1915.
- McBryde, Charles N. A Bacteriological Study of Ham Souring. (U. S. Department of Agriculture. Bureau of Animal Industry. Bulletin 132.) Washington, D. C., 1911.
- A Study of the Methods of Canning Meats, with Reference to the Proper Disposal of Defective Cans. (U. S. Department of Agricul-

- ture. 24th Annual Report. 1907. pp. 279-96.) Washington, D. C., 1909.
- McLean, J. The Thromboplastic Action of Cephalin. (American Journal of Physiology. Vol. XLI, pp. 250-57.) Baltimore, 1916.
- The Packers' Encyclopedia. Ed. by Paul I. Aldrich. Chicago, 1922.
- Rogers, Allen. Practical Tanning. New York, 1922.
- Seymour-Jones, F. L. Art and Science of Leather Manufacture. (Chemical and Metallurgical Engineering, Vol. 27, No. 23.) New York, Jan. 6, 1922.
- Swift and Company. Little Journeys through the Plants of Swift & Co. Chicago, 1920.
- Thurston, Azor. Pharmaceutical and Food Analysis. New York, 1922.
- U. S. Federal Trade Commission. Food Investigation. Report on the Meat Packing Industry. Pt. I. Chapter VIII: Physical Operations of By-Product Preparation and Manufacture. Washington, D. C., 1918.
- Whalin, C. V. By-Products of the Slaughtering and Meat Packing Industry. (U. S. Federal Trade Commission. Food Investigation. Report on the Meat Packing Industry. Pt. I, Exhibit XVII, pp. 545-74.) Washington, D. C., 1918.
- Wilder, Fred W. The Modern Packing House. Chicago, 1905.

CHAPTER XVII

- Armour, Jonathan Ogden. The Packers, the Private Car Lines and the People. Philadelphia, 1906.
- Boyle, James E. The Chicago Board of Trade: What it is and What it Does. Chicago, 1921.
- Speculation and the Chicago Board of Trade. Chicago, 1920.
- Brace, Harrison H. The Value of Organized Speculation. Boston, 1913.
- Chapin, Robert M. The Hygiene of the Transportation of Animal-Food Products by Rail, Boat and Wagon in the United States. (15th International Congress of Hygiene and Demography. Transactions. Vol. V, Pt. 1, pp. 121-28.) Washington, 1913.
- Chicago Board of Trade. Rules and By-Laws. Published annually.
- Clemen, R. A. Jobs that Motor Trucks Do Better. (System. Vol. 36, pp. 852-55.) Chicago, Nov., 1919.
- Parsons, Frank. The Heart of the Railroad Problem. Boston, 1906.
- Review of Transportation Cases of the Packers. (Harvard Law Review, Vol. XXX.) Cambridge, Mass., 1916-17.
- Ripley, William Z. Railroads, Rates and Regulations. New York, 1912.
- Roy, E. L. The Relation of the Chicago Board of Trade to the Packing

- Industry. (The National Provisioner, Vol. 49, No. 13, p. 106.) New York, Sept. 27, 1913.
- Russell, Charles E. The Greatest Trust in the World. New York, 1906.
- Taylor, Charles H. History of the Chicago Board of Trade. Chicago, 1917.
- U. S. Bureau of Corporations. Report on the Beef Industry. (Garfield Report.) Washington, 1905.
- U. S. Congress. House. Committee on Agriculture. Cold Storage Legislation. Hearings. 66th Congress, 1st Session. Washington, 1919.
- U. S. Federal Trade Commission. Food Investigation. Report on Private Car Lines. Washington, 1920.
- Food Investigation. Report on the Meat Packing Industry. Pt. I, Chapter 3; Pt. IV, Chapter 2. Washington, 1919.
- Weld, Louis D. H. Private Freight Cars and American Railways. (Columbia University. Studies in History, Economics and Public Law. Vol. XXXI, No. 1) New York, 1908.
- Wilson, Everett. Armour's Distributing System. Armco. Chicago, July, 1914.
- Armour's Distributing System. Outline of its Origin and Growth. (Armour Magazine. Vol. V, No. 2.) Chicago, Feb., 1916.

CHAPTER XIX

- Armour & Co. Bureau of Agricultural Research and Economics. Handbook of Agriculture. Chicago, 1919.
- Boney, Richard K. Meat Production in Louisiana. Baltimore, 1917.
- Chicago Daily Drivers' Journal. Yearbooks of Figures. Chicago.
- Cotton, J. S. Range Movement. (U. S. Department of Agriculture. Yearbook 1906, pp. 225-38.) Washington, D. C., 1907.
- and Cooper, Morton O. Methods and Cost of Growing Beef Cattle in the Corn Belt States. (U. S. Department of Agriculture. Report No. 111. Pt. IV.) Washington, D. C., 1916.
- and Ward, W. F. Economical Cattle Feeding in the Corn Belt. (U. S. Department of Agriculture. Farmers' Bulletin, p. 588.) Washington, 1914.
- Ewing, Perry V. Southern Pork Production. New York, 1918.
- Farley, F. W. Growth of the Beef Cattle Industry in the South. (U. S. Department of Agriculture. Yearbook 1917, pp. 327-40.) Washington, 1918.
- Ferguson, Meade. Production of Beef Cattle in the East: Views of Governor Stuart of Virginia. (Review of Reviews, Vol. 55, pp. 298-99.) New York, March, 1917.

- Fisher, A. America's Meat Supply. (Yale Review, Vol. VI.) New Haven, Conn., July, 1917.
- Gray, Daniel T., and Ward, W. F. Beef Production in Alabama. (U. S. Department of Agriculture. Bureau of Animal Industry. Bulletin 131.) Washington, D. C., 1911.
- Horine, M. F. Present and Future Cattle Supply. Chicago, 1921.
- Jardine, James T. Increased Cattle Production on the Southwestern Ranges. (U. S. Department of Agriculture. Bulletin 588.) Washington, D. C., 1917.
- Livestock Routes and Markets. (U. S. Department of Agriculture. Yearbook 1908, pp. 232-36.) Washington, D. C., 1909.
- Macdonald, James. Food from the Far West. New York, 1878.
- Mumford, Herbert W., and Hall, Louis D. Beef Production in the United States. (The National Provisioner. Vol. L, No. 3, p. 19.) New York, Jan. 17, 1914.
- Pearse, Albert W. The World's Meat Future. London, 1920.
- Price Current Grain Reporter. Yearbooks. Chicago.
- U. S. Federal Trade Commission. Report on the Meat Packing Industry. Part I. Washington, 1918.
- Wallace's Farmer. Des Moines, Iowa. 1874.
- Weld, Louis D. H. Live Stock and Meat Situation. (Annals. American Academy. Vol. 78, pp. 168-75.) Philadelphia, July, 1918.
- Wentworth, Edward N. Monthly Letters to Animal Husbandmen. Armour & Co. Armour's Livestock Bureau. Chicago.

CHAPTER XX

- Holman, Charles N. Cooperative Packing Plants. (National Agricultural Organization Society. Circular No. 6.) Madison, Wis.
- Lincoln, C. C. The Cattle Raising Industry of the Southwest. Los Angeles, 1921.
- McCoy, Joseph G. Historic Sketches of the Cattle Trade of the West and Southwest. Kansas City, Mo., 1874.
- Perry, Edward W. Live Stock and Meat Traffic of Chicago. (U. S. Department of Agriculture, Bureau of Animal Industry, Report 1884, pp. 245-69.) Washington, D. C., 1885.
- Powell, Cuthbert. Twenty Years of Kansas City's Live Stock Trade and Traders. Kansas City, Mo., 1892.

CHAPTER XXI

- Hamel, George T. Modern Practice of Canning Meats. St. Louis, 1911.
- Haring, A., and Hislop, W. The Products of the Farm Slaughterhouse,

- Sausage Kitchen and Smoke House. (Washington State College, Dept. Extension, Bulletin 10.) Pullman, Wash., 1916.
- Lund, Franz P. Home Canning of Meats and Sea Food. Washington, D. C., 1909.
- McBryde, C. N. Commercial Methods of Canning Meats. (U. S. Department of Agriculture. Yearbook 1911, pp. 383-90.) Washington, D. C., 1912.
- The Packers' Encyclopedia. Ed. by Paul I. Aldrich. Chicago, 1922.
- Powell, Ola. Successful Canning and Preserving. Philadelphia, 1917.
- Wooley, Edward Mott. Packing for Pershing. (McClure's Magazine, Vol. 50, No. 14, p. 24.) New York, Dec., 1918.

CHAPTER XXII

- Babcock, Ernest B., and Clausen, Roy E. Genetics in Relation to Agriculture. New York, 1918.
- Bruce, Robert. Fifty Years among Shorthorns. London, 1907.
- Burkett, Charles W. First Principles of Feeding Farm Animals. New York, 1913.
- Castle, William E. Heredity and Eugenics. Chicago, 1912.
- Cattle Breeds and Management. London, Vinton & Co.
- Coburn, Foster D. Swine Husbandry. New York, 1903.
- Swine in America. New York, 1909.
- Coffey, Walter C. Productive Sheep Husbandry. Philadelphia, 1918.
- Craig, John A. Judging Live Stock. Des Moines, Iowa, 1901.
- Sheep Farming in North America. New York, 1913.
- Craig, Robert A. Common Diseases of Farm Animals. Philadelphia, 1916.
- Curtis, Robert S. The Fundamentals of Livestock Judging and Selection. Philadelphia, 1915.
- Davis, Joseph R., and Duncan, Harvey S. History of the Poland-China Breed of Swine. Omaha, 1921.
- Dawson, Charles. Success with Hogs. Chicago, 1919.
- Dawson, Henry C. The Hog Book. Chicago, 1911.
- Day, George E. Productive Swine Husbandry. Philadelphia, 1913.
- Dietrich, William. Swine. Chicago, 1910.
- Doane, Duane H. Sheep Feeding and Farm Management. Boston, 1912.
- East, Edward M., and Jones, Donald F. Inbreeding and Outbreeding. Philadelphia, 1919.
- Ewing, Perry V. Southern Pork Production. New York, 1918.
- Gay, Carl W. The Breeds of Livestock. New York, 1916.
- Principles and Practice of Judging Livestock. New York, 1916.

- Hadley, Frederick B. *Principles of Veterinary Science*. Philadelphia, 1920.
- Harper, Merritt W. *The Breeding of Farm Animals*. New York, 1914.
- Henry, William A., and Morrison, F. B. *Feeds and Feeding*. Madison, Wis., 1917.
- Jordan, Whitman H. *The Feeding of Animals*. New York, 1901.
- Kellner, Oskar. *The Scientific Feeding of Animals*. London, 1909.
- Kennedy, Willard J. *Profitable Pork Production*. Nevada, Iowa, 1912.
- Kleinheinz, Frank. *Sheep Management*. Madison, Wis., 1918.
- Knisley, Albert T. *Swine Diseases*. Chicago, 1914.
- Lovejoy, Andrew J. *Forty Years Experience as a Hog Man*. Springfield, Ill., 1914.
- Lynch, Charles F. *Diseases of Swine*. Philadelphia, 1914.
- McDonald, James, and Sinclair, James. *History of Aberdeen-Angus Cattle*. London, 1910.
- *History of Hereford Cattle*. London, 1909.
- *History of Shorthorn Cattle*. London, Vinton & Co.
- Marshall, Frederick R. *Breeding Farm Animals*. Chicago, 1911.
- Miller, H. H., and others. *The Western Lamb*. Mechanicsburg, O.
- Modern Sheep, Breeds and Management*. Chicago, American Sheep Breeder Co.
- Mumford, Frederick B. *The Breeding of Animals*. New York, 1917.
- Plumb, Charles S. *Beginnings in Animal Husbandry*. St. Paul, Minn., 1912.
- *A Study of Farm Animals*. St. Paul, Minn., Webb Pub. Co.
- *Types and Breeds of Farm Animals*. Boston, 1920.
- Potter, Ermine L. *Western Live Stock Management*. New York, 1917.
- Pulling, Albert L. *Aberdeen-Angus Cattle*. London, 1908.
- Roberts, David. *Cattle, Breeds and Origin*. Waukesha, Wis., 1916.
- Sanders, Alvin H. *Shorthorn Cattle*. Chicago, 1900.
- *The Story of the Herefords*. Chicago, 1914.
- Shaw, Thomas. *The Management and Feeding of Sheep*. New York, 1914.
- Smith, Howard R. *Profitable Stock Feeding*. Lincoln, Neb., 1906.
- Stewart, Henry. *The Domestic Sheep*. American Sheep Breeder Press, 1900.
- U. S. Department of Agriculture. *Bulletins*: 20. *The Management of Sheep on the Farm*. 94. *The Wool Grower and the Wool Trade*. 313. *Features of the Sheep Industry of the United States, New Zealand and Australia compared*.
- *Farmers' Bulletins*: 205. *Pig Management*. 272. *A Successful Hog and Seed-Corn Farm*. 374. *Hog Cholera*. 566. *Boy's Pig*

- Club. 713. Sheep Scab. 789. Sheep Tick and Its Eradication by Dipping. 810. Equipment for Farm Sheep Raising. 840. Farm Sheep Raising for Beginners. 874. Swine Management. 913. Killing Hogs and Curing Pork. 929. The Place of Sheep on New England Farms. 935. The Sheep Killing Dog. 1051. Sheep on Irrigated Farms in the Northwest.
- Bureau of Animal Industry. Circular 193. Our Present Knowledge of the Distribution and Importance of Some Parasitic Diseases of Sheep and Cattle in the United States. Washington, D. C.
- Vaughan, Henry W. Types and Market Classes of Livestock. Columbus, Ohio, 1921.
- Wentworth, Edward N. Progressive Beef Cattle Raising. Chicago, 1920.
- Progressive Hog Raising. Chicago, 1922.
- Progressive Sheep Raising. Chicago, 1923.
- Widtsoe, John A., and Stewart, G. Western Agriculture. St. Paul, Minn., 1918.
- Wilson, James. The Principles of Stock Breeding. London, 1912.
- Wing, Joseph E. Sheep Farming in America. Chicago, 1907.
- Woll, Fritz W. Productive Feeding of Farm Animals. Philadelphia, 1916.
- Wrightson, John. Sheep Breeds and Management. London, Vinton & Co.

CHAPTER XXIII

- Cole, Charles S. Cattle Loans and their Value to Investors. (U. S. Department of Agriculture. Yearbook 1918, pp. 101-8.) Washington, D. C., 1919.
- Dickey, W. P. My Experiences with Cattle Paper. (Bankers' Magazine. Vol. 90, pp. 725-8.) New York, June, 1915.
- Harris, Beverly D. Financing the Cattle Industry. (Rand McNally's Bankers' Monthly. Vol. XXXIII, No. 5, p. 35.) Chicago, May, 1916.
- Larmer, Forrest M. The Cattle Loan Co. (Journal of Political Economy. Vol. XXVI, No. 8, pp. 807-31.) Chicago, Oct., 1918.
- Newman, Victor A. Analysis of the Business Methods of Cattle Loan Banks and Companies. Kansas City, Mo., 1922.
- Shepherd, F. N. Cattle Loans. (Bankers' Magazine. Vol. 94, pp. 13-16.) New York, Jan., 1917.
- Wright, Ivan. Bank Credit and Agriculture. New York, 1922.
- Wright, Wirt. Live Beef Loans. (Bankers' Magazine. Vol. 90, pp. 358-63.) New York, March, 1915.

CHAPTER XXIV

- The Agricultural Outlook. (U. S. Department of Agriculture. Farmers' Bulletin No. 651.) Washington, Feb. 6, 1915.
- Andrews, Frank. Cost and Methods of Transporting Meat Animals. (U. S. Department of Agriculture Yearbook 1908, pp. 227-44.) Washington, D. C., 1909.
- Marketing Grain and Livestock in the Pacific Coast Region. (U. S. Department of Agriculture. Bureau of Statistics. Bulletin 89.) Washington, D. C., 1911.
- Argentine Beef. (The Agricultural Outlook. U. S. Department of Agriculture. Farmers' Bulletin No. 581, pp. 30-40.) Washington, D. C., March 18, 1914.
- Armour, Jonathan Ogden. The Packers, the Private Car Lines and the People. Philadelphia, 1906.
- Chicago Daily Drovers Journal. Yearbooks. Chicago.
- Chicago Live Stock Exchange. Rules and By-Laws. Chicago.
- Chicago Union Stock Yards Co. Annual Reports. Chicago.
- Cincinnati Chamber of Commerce. Reports. Cincinnati, Ohio.
- Cleveland Chamber of Commerce. Annual Reports. Cleveland, Ohio.
- Davenport, Arthur C. The American Live Stock Market: How it Functions. Chicago, 1922.
- Denver Union Stock Yards Co. Annual Reports. Denver, Colo.
- Doane, Duane H. The Cooperative Lamb Club as an Agency for Lower Marketing Costs. (Annals. American Academy of Political and Social Science. Vol. 50; pp. 216-22.) Philadelphia, Nov., 1913.
- Grand, Joseph. Illustrated History of the Union Stockyards. Chicago, 1901.
- Hall, Louis D., Simpson, F. M., and Doty, S. W. Methods and Cost of Marketing Live Stock and Meats. (Pt. V. Meat Situation in the United States. U. S. Department of Agriculture. Report Nos. 109-113.) Washington, D. C., 1916.
- Holmes, George K. Meat Supply and Surplus. (U. S. Department of Agriculture. Bureau of Statistics. Bulletin 55.) Washington, D. C., 1907.
- Huebner, Grover G. Agricultural Commerce. New York, 1917.
- Indianapolis Stock Yards Co. Annual Reports. Indianapolis, Ind.
- Livestock of the United States. (The Agricultural Outlook. U. S. Department of Agriculture. Farmers' Bulletin 575.) Washington, D. C., Feb. 7, 1914.
- Meat Animals and Packing House Products Imported into Eleven Principal Countries, 1895-1904. (U. S. Department of Agriculture. Bureau of Statistics. Bulletin 40.) Washington, D. C., 1906.

- Meat in Foreign Markets, Tariffs of Fourteen Importing Nations and Countries of Surplus. (U. S. Department of Agriculture. Bureau of Statistics. Bulletin 39.) Washington, D. C., 1905.
- Meat Situation in the United States. (U. S. Department of Agriculture. Report Nos. 109-113.) Washington, D. C., 1916.
- Monthly Variation in Numbers of Farm Animals. (Agricultural Outlook. U. S. Department of Agriculture. Farmers' Bulletin 590, pp. 8-10.) Washington, D. C., April 23, 1914.
- The National Provisioner. New York and Chicago.
- Nourse, E. G., and Hammana, C. W. Cooperative Live Stock Shipping in Iowa in 1920. (Iowa Agricultural Experiment Station. Bulletin No. 200.) Ames, Iowa, 1921.
- Omaha Union Stock Yards Co. Annual Reports, Omaha, Neb.
- Poole, James E. The Cooperative Shipping of Hogs. (Breeders' Gazette. Vol. LXXX, No. 18.) Chicago, Nov. 3, 1921.
- Price-Current—Grain Reporter. Yearbooks. Chicago.
- St. Joseph Stock Yards Co. Annual Reports. St. Joseph, Mo.
- St. Louis Merchants' Exchange. Annual Reports. St. Louis, Mo.
- St. Paul Stock Yards Co. Annual Reports. St. Paul, Minn.
- Shackleton, Robert. The Book of Chicago. Philadelphia, 1920.
- Sioux City Stock Yards Co. Annual Reports. Sioux City, Iowa.
- Union Stockyard and Transit Company of Chicago. Annual Reports. Chicago.
- U. S. Bureau of Corporations. Report on the Beef Industry. Washington, D. C., 1905.
- U. S. Bureau of Foreign and Domestic Commerce. Annual Commerce and Navigation Reports. Washington, D. C.
- U. S. Congress. Joint Commission of Agricultural Inquiry. Washington, D. C., 1921.
- U. S. Department of Agriculture. Yearbooks. Washington, D. C.
- Bureau of Animal Industry. Annual Reports. Washington, D. C.
- U. S. Department of Commerce and Labor. Bureau of Statistics. Monthly Summary of Commerce and Finance. Washington, D. C. 1905-11.
- U. S. Department of Interior. Census Office. 13th Census. Agriculture 1910. Vol. V, pp. 227-529. Washington, D. C., 1913.
- Census Office. 13th Census. Manufactures 1910. Vol. X, pp. 343-45. Washington, D. C., 1913.
- U. S. Federal Trade Commission. Food Investigation. Report on Meat Packing Industry. Pt. VI. Cost of Marketing Livestock. Washington, D. C., 1920.

- U. S. Industrial Commission. Distribution and Marketing of Farm Products. Vol. VI, Pt. 5. Washington, D. C., 1901.
- U. S. Interstate Commerce Commission. I. C. C. Reports. Vol. XI, pp. 277-95. Cattle Raisers Association of Texas . . . vs. Chicago, Burlington & Quincy R. R. Washington, D. C., 1906. Vol. XXII, pp. 160-77. [Investigation regarding rates for transportation of livestock.] Vol. XXIII, pp. 7-12. In the Matter of the Investigation and Suspension of Advances in Rates by Carriers for the Transportation of Cattle and Sheep. Washington, D. C., 1912.
- U. S. Tariff Board. Wool and Manufactures of Wool. Washington, D. C., 1912.
- Ward, William F. The Shrinkage in Weight of Cattle in Transit. (U. S. Department of Agriculture. Bureau of Animal Industry. Bulletin 25.) Washington, D. C., 1913.
- Warner, K. F. The Marketing of Live Stock Products in Minnesota. (Studies in the Marketing of Farm Products, by L. D. H. Weld and others. University of Minnesota, 1915.)
- Weld, Louis D. H. Marketing of Farm Products. New York, 1916.
- Statistics of Cooperation among Farmers in Minnesota. Minnesota Agricultural Experiment Station. Bulletin 146, pp. 17-18.
- Studies in Marketing of Farm Products. (University of Minnesota Studies in the Social Sciences. No. 4, pp. 15-37.) Minneapolis, Minn., Feb., 1915.
- Wichita Stock Yards Co. Annual Reports. Wichita, Kansas.

CHAPTER XXIX

- Conference Relative to the Marketing of Live Stock, Distribution of Meats and Related Matters. Chicago, 1915. Proceedings. Washington, D. C., 1916.
- Doty, S. W., and Poole, James E. Two Sides of the Zone System. (Breeder's Gazette, Vol. 78, No. 2, pp. 55-6.) Chicago, July 8, 1920.
- Hibbard, Benjamin H. Marketing Agricultural Products. New York, 1921.
- Macklin, Theodore. Efficient Marketing for Agriculture. New York, 1922.
- National Conference on Marketing and Farm Credits. Marketing and Farm Credits. A collection of papers read at the third annual session of the National Conference on Marketing and Farm Credits in joint program with the National Council of Farmers' Cooperative Associations. Chicago, 1915.

- U. S. Congress. Joint Commission of Agricultural Inquiry. Report. Washington, 1921.
- Wallace, Henry A. Agricultural Prices. Des Moines, Iowa, 1920.
- Weld, Louis D. H. Marketing of Farm Products. New York, 1916.

CHAPTER XXX

- Armour & Co. The Live Stock Producer and Armour. Chicago, 1919.
- Conference Relative to the Marketing of Live Stock, Distribution of Meats and Related Matters. Chicago, 1915. Proceedings. Washington, D. C., 1916.
- Doty, S. W., and Hall, L. D. Cooperative Live Stock Shipping Associations. (U. S. Department of Agriculture. Farmers' Bulletin 718.) Washington, D. C., 1916.
- Farm Bureau Marketing Plan. (The National Provisioner. Vol. LXV. No. 19, p. 27.) New York, November 5, 1921.
- Hibbard, Benjamin H. Marketing Agricultural Products. New York, 1921.
- Kile, Orville M. The Farm Bureau Movement. New York, 1921.
- National Conference on Marketing and Farm Credits. Marketing and Farm Credits. A Collection of Papers and documents read at the fourth annual session of the National Conference on Marketing and Farm Credits at Chicago, December 4-9, 1916. Madison, Wis., 1917.
- National Live Stock Exchange. Bulletin. Chicago, Nov. 15, 1920.
- Searcy, James T. Searcy's Cooperative Plan of Shipping Hogs and Cattle to the Larger Markets. Columbus, Miss., 1917.
- Wallace's Farmer, Vol. 47, No. 10. Des Moines, Iowa. March 10, 1922.
- Wilson, Thomas E. Mutual Problems in the Live Stock and Meat Industry. Chicago, 1922.

CHAPTER XXXI

- Abbott, Edith, and Breckenridge, S. P. Women in Industry: The Chicago Stockyards. (Journal of Political Economy. Vol. XIX, No. 8, pp. 632-54.) Chicago, Oct., 1911.
- Amalgamated Meat Cutters and Butcher Workmen of North America. Official Journal. Vol. II, Syracuse, N. Y., 1902.
- Bushnell, Charles J. Some Social Aspects of the Chicago Stockyard. (American Journal of Sociology. Vol. 7, pp. 145-70, 289-330, 433-74, 687-702.) Chicago, Sept., 1901-March, 1902.
- Commons, John R. Labor Conditions in Meat Packing and the Recent Strike. (Quarterly Journal of Economics, Vol. XIX, pp. 1-32.) Cambridge, Mass., Nov., 1904.

- Fitzpatrick, John. Statement in Hearings before Federal Judge Samuel Alschuler. Chicago, 1918.
- Glocker, Theodore W. The Unit of Government in the Meat Cutters and Butcher Workmen's Union. (Johns Hopkins Economic Studies.) Baltimore, June, 1905.
- Hard, William. Labor in the Chicago Stockyards. (The Outlook. Vol. 83, pp. 366-73.) New York, June 16, 1906.
- Institute of American Meat Packers. The Theory of Packinghouse Accounting. Chicago, 1920.
- McDowell, Mary E. How Casual Work Undermines Family and Neighborhood Life. (National Conference of Charities and Corrections. Proceedings 1909, pp. 150-56.)
- The National Provisioner. New York, 1904.
- Parker, Carleton H. Labor Policy of the American Trusts. (Atlantic Monthly. Vol. 125, No. 2, pp. 225-34.) Boston, Feb., 1920.
- Roosevelt, Theodore. Message of the President transmitting report of a special committee to investigate conditions in the Chicago stockyards. (59th Congress, 1st Session, House Document 873.) Washington, 1906.
- Sinclair, Upton. The Jungle. New York, 1906.
- Thompson, C. W. Labor in the Packing Industry. (Journal of Political Economy. Vol. 15, No. 2, pp. 88-107.) Chicago, Feb., 1907.
- U. S. Bureau of Labor. Bulletin No. 56. Letter of Commissioner to the President on the Influence of Trade Unions on Immigrants. Washington, 1905.
- U. S. Congress. House Committee on Agriculture. Hearings . . . on the so-called "Beveridge Amendment" to the Agricultural Appropriation Bill (H. R. 18537). Washington, 1906.
- U. S. Department of Labor. Bureau of Labor Statistics. Bulletin No. 252. Wages and Hours in the Slaughtering and Meat Packing Industry, Washington, 1917.

CHAPTER XXXII

- Adams, Kate J. Humanizing a Great Industry. Chicago, 1920.
- Alschuler, Samuel. Awards as Labor Administrator of the Packing Industry. Chicago, 1918-19.
- Calder, John. Personnel Problems of Swift and Company. (Commerce and Administration.) Chicago, Feb., 1922.
- Kennedy, J. C., and others. Wages and Family Budgets in the Chicago Stockyards District. A Study of Chicago's Stockyards Community. III. Chicago, 1914.

- Mathews, Shailer. *Packingtown Today*. (World Today. Vol. 12, pp. 488-502.) Chicago, May, 1907.
- Rogers, Sherman. *Employee Representation and the Stockyards Strike*. (Outlook, Vol. 129, pp. 681-82.) New York, Dec., 1921.
- Stolberg, Benjamin. *The Stockyards Strike*. (The Nation, Vol. 114, pp. 91-92.) New York, Jan. 25, 1922.
- U. S. Department of Labor. Bureau of Labor Statistics. *Descriptions of Occupations. Slaughtering and Meat Packing*. Washington, D. C., 1918.
- *Labor Award in Packinghouse Industries*. (Monthly Review, Vol. 6, pp. 1163-75.) Washington, D. C., May, 1918.
- U. S. President. *Mediation Commission. Report*. Washington, D. C., 1918.

CHAPTER XXXIII

- Armour, Jonathan Ogden. *In the Matter of the Investigation of the Packing Industry. Testimony . . . January 21, 1919, before the Committee on Interstate and Foreign Commerce, on Bill H. R. 13324*. Chicago, 1919.
- *The Packers, the Private Car Lines and the People*. Philadelphia, 1906.
- Australia. *Royal Commission on Meat Export Trade. Report 1914-15*. Melbourne.
- Camp, William R. *Reforms in the System of Food Distribution*. (Journal of Political Economy. Vol. XXIX, No. 10.) Chicago, Dec., 1921.
- Croxton, F. C. *Beef Prices*. (Journal of Political Economy. Vol. 13, pp. 201-16.) Chicago, March, 1905.
- *Beef Prices (in the United States, 1890-1902)*. (U. S. Bureau of Labor. Bulletin, Vol. 7, pp. 794-806.) Washington, D. C., July, 1902.
- Durand, Edward Dana. *Beef Industry and the Government Investigations*. (American Review of Reviews. Vol. 31, pp. 464-71.) New York, April, 1905.
- Erskine, Thomas E. *U. S. Report on the Cattle and Meat Trade*. London, 1902.
- Garfield, James R. *Comparison of the Prices of Cattle and of Dressed Beef*. (The Beef Industry, Chap. IV. In *The National Provisioner*, Vol. 33, No. 13, p. 19.) New York, Sept. 23, 1905.
- Great Britain. Board of Trade. *Committee on Combinations in the Meat Trade. Report*. London, 1909.
- Hill, William. *Conditions in the Cattle Industry*. (Journal of Political Economy. Vol. 13, pp. 1-12.) Chicago, Dec., 1904.

- Relation of Packers' Credit to Panic and Prices. (Journal of Political Economy. Vol. 16, pp. 87-102.) Chicago, Feb., 1908.
- Hirschauer, Herman. The Dark Side of the Beef Trust. Jamestown, N. Y., 1905.
- The Production and Consumption of Meat and the Prices, Movement and Registration of Live Stock in the United States. (U. S. Department of Agriculture. Bureau of Animal Industry, 22nd Report 1905, pp. 277-97.) Washington, D. C., 1907.
- Russell, Charles E. The Greatest Trust in the World. New York, 1906.
- Ryan, Michael. Prospects of the Meat Packing Industry. (Annals. American Academy of Political and Social Science. Vol. 34, pp. 471-6.) Philadelphia, Nov., 1909.
- Shiel, Roger R. Early to Bed and Early to Rise, or Twenty Years in Hell with the Beef Trust. Indianapolis, 1909.
- Swift and Company. Analysis and Criticism of Part II of the Federal Trade Commission Report. Chicago, 1918.
- Swift and Company vs. United States. (Beef Trust Case) 196 U. S. 395.
- U. S. Bureau of the Census. Census of Manufactures. 1905. Slaughtering and Meat Packing. Washington, 1907.
- U. S. Bureau of Corporations. Report on the Beef Industry. (Garfield Report.) Washington, D. C., 1905.
- U. S. Department of Agriculture. Division of Statistics. Wages and Prices of Commodities. Washington, D. C., 1910.
- U. S. Department of Justice. Argument of the Attorney General in United States vs. Armour & Co. et al. before Judge Humphrey in the U. S. District Court for the northern district of Illinois, together with statement of the case and reprint of the constitutional provision and the statutes under discussion and the opinion and ruling of Judge Humphrey. Washington, D. C., 1906.
- U. S. Federal Trade Commission. Food Investigation. Report on the Meat Packing Industry. Summary and Pt. I. Washington, D. C., 1918.
- U. S. President (Roosevelt). Message April 18, 1905, relative to the decision in the Beef Trust Case. Congressional Record. 59th Congress, 1st Session. Vol. 40. Pt. 6: 5500. Washington, D. C., 1906.
- Vest, G. G. Transportation and Sale of Meat Products. (U. S. Senate Report. Vol. 3, No. 829. 51st Congress, 1st Session.) Washington, D. C., 1890.
- Walker, Albert H. History of the Sherman Law. New York, 1910.
- Walker, Francis. The "Beef Trust" and the United States Government. (The Economic Journal. Vol. XVI, No. 64.) London, Dec., 1906.

- Weld, Louis D. H. Testimony in Hearings of the House Committee on Agriculture on Meat-Packer Legislation. (H. R. 6492.) March 11, 1920. Washington, D. C., 1920.
- Wilkinson, Harold L. Trust Movement in Australia. Melbourne, Australia, 1914.
- Wyman, Bruce. Control of the Market. Boston, 1911.

CHAPTER XXXIV

- Colver, William B. Federal Trade Commission and the Meat Packing Industry. (American Academy of Political and Social Science. Annals. Vol. 82, pp. 170-74.) Philadelphia, March, 1919.
- Swift and Company. Rejoinder to the Statement of the Federal Trade Commission. Chicago, 1918.
- Reply to Questions submitted July 23, 1917, by the Federal Trade Commission. Chicago, 1917.
- Statement issued August 19, 1918, on summary of the Report of the Federal Trade Commission on the Meat Packing Industry. Chicago, 1918.
- U. S. Congress. House. Committee on the Judiciary. Investigation of the Beef Industries. Hearings on H. Res. 148. (Serial 43.) Pts. 1-2. Washington, 1916.
- U. S. Federal Trade Commission. Food Investigation. A Message from the President transmitting Summary of Report of the Federal Trade Commission on the Meat Packing Industry. Washington, 1918.
- Food Investigation. Report on the Meat Packing Industry. Parts I-IV. Washington, D. C., 1918-20.
- Meat Packers' Profits Investigation. Report to the Senate. (Congressional Record, 66th Congress, 1st Session. Vol. 58, No. 103.) Washington, D. C., Sept. 24, 1919.

CHAPTER XXXV

- Institute of American Meat Packers. Newspaper Comment regarding Proposed Legislation to License and Restrict Business. Chicago, 1919.
- U. S. Federal Trade Commission. Maximum Profit Limitation on Meat Packing. Washington, 1919.
- U. S. Food Administration. Confidential Report to the President on Control of the Packing Industry made Public by Mr. Wilson's Order. U. S. Committee on Public Information. Official Bulletin. 1919.
- U. S. House. Committee on Interstate and Foreign Commerce. Govern-

- ment Control of the Meat Packing Industry. Hearings. 65th Congress, 2nd Session. Hearings. Washington, D. C., 1920.
- U. S. House. Committee on Agriculture. Meat Packer Legislation. 60th Congress, 2nd Session. Hearings. Washington, D. C., 1920.
- U. S. Senate. Committee on Agriculture and Forestry. Hearings. 65th Congress, 3rd Session on S. 5305. Washington, 1919.
- U. S. Senate. Sub-Committee on Agriculture and Forestry. Government Control of the Meat Packing Industry. Hearings. 65th Congress, 2nd Session on S. Res. 221 in favor of government control and operation of packing houses and packing plants during the war. Washington, D. C., 1918.
- Weld, Louis D. H. Government and the Packers. (Annals American Academy of Political and Social Science. Vol. 82, pp. 175-82.) Philadelphia, March, 1919.

CHAPTER XXXVI

- Armour & Co. Armour Magazine. (House organ.) Chicago.
- Armour & Co. Bureau of Agricultural Research and Economics. Handbook of Agriculture. Chicago, 1921.
- The Butchers' Advocate. New York.
- The Butchers' and Packers Gazette. St. Louis and Chicago.
- Clemen, Rudolf A. Economic Bases of the American System of Large-Scale Meat Packing. (Proceedings. American Historical Association.) Washington, D. C., 1920.
- Hibbard, Benjamin H. Marketing Agricultural Products. New York, 1921.
- Holman, Charles W. Cooperative Packing Plants. (National Agricultural Organization Society. Circular 6.) Madison, Wis.
- Morris & Co. Morris Standard. (House organ.) Chicago.
- The National Provisioner. New York and Chicago.
- The Packers' Encyclopedia. Edited by Paul I. Aldrich. Chicago, 1922.
- Swift & Co. The Swift Arrow and the Buzzer. (House organs.) Chicago.
- U. S. Bureau of the Census. 13th Census. Manufactures. 1909. Statistics of the Slaughtering and Meat-Packing Industry. Washington, D. C., 1913.
- Census of Manufactures. 1914. Slaughtering and Meat Packing. Washington, D. C., 1917.
- The same. 1919. Washington, D. C., 1920.
- U. S. Food Administration. Economies in Handling Meat. Report of Butchers' and Meat Dealers' Economy Committee. Washington, D. C., 1918.

INDEX

A

- ABERDEEN, ANGUS CATTLE, 437, 483.
 ABILENE, COWTOWN, 193.
 ACCOUNTING BRANCH HOUSE, 389 (See also "Cost Accounting").
 ACID PHOSPHATE, manufacture, 368.
 ADMINISTRATION OF PACKER PLANTS, World War problems, 477; decentralization trend, 800-802.
 AETNA TRADING CO., casings, 753*n*.
 AGAR, J. S., officer, Packers' Assn., 803*n*.
 AGENCIES, DRESSED MEAT TRAFFIC, 237 (See also "commission men").
 AGRARIANS, AND AMERICAN MEAT, 282, 284, 288, 295.
 AGRICULTURAL ADVISORY BOARD, hog price control, 652, 654, 656*n*.
 AGRICULTURE, revolution, 47; westward trend and cattle ranges, 189.
 AKRON, dressed beef fight, 244.
 ALABAMA, wild hogs, 35; hogs, 51, 442; cattle, 65, 440; packing, 461; livestock exchange, 553*n*.
 ALBANY, livestock market, 78, 203; oleomargarine works, 359; Armour branch house, 389.
 ALBUMEN, wartime supply, 477.
 ALLBRIGHT, W. B., refrigeration, 216; lard, 358, 369; chemist, 361.
 ALLBRIGHT-NELL CO., 361.
 ALLEGHENIES, livestock droving, 59, 64, 81.
 ALLERDICE, JOSEPH, officer, Packers' Assn., 803*n*.
 ALLERTON, S. W., arbitrator, 241.
 ALLIED PACKERS, 801.
 ALSCHULER, SAMUEL, labor administrator, 719, 720.
 ALTMAN, G. N., stockyards, 205*n*.
 ALTON, packing, 79, 100, 105, 108, 138, 143; slaughtering and packing, by-products, 123, 128, 130, 133.
 ALTOONA, sheep center, 444.
 AMALGAMATED MEAT CUTTERS AND BUTCHER WORKMEN, origin, policy, gains, 694-699; early strikes, 699; strike of 1904, effect, 700-705; opposition to employee representation, strike of 1921, 736-743.
 AMARILLO, beef market (1921), 257.
 AMERICAN FARM BUREAU FED., program, 663-665; livestock board, 675.
 AMERICAN MEAT CANNING CO., 466*n*.
 AMERICAN MEAT PACKERS' ASSN., 802, 803.
 AMERICAN NAT. LIVESTOCK ASSN., headquarters, 460; Capper bill, 532*n*; market reform, 625; live stock board, 675; resolutions against packers, 769; co-operation with institute, 804.
 AMERICAN PASTORAL, 186.
 AMERICAN PORK PACKERS' ASSN., combination, 751.
 ANCHOR PACKING CO., plant, 454.
 ANDALUSIA, packing, 461.
 ANGLO-AMERICAN PACKING & PROVISION CO., plant, 453; canning, 466*n*; absorbed, 761*n*.
 ANGLO-AMERICAN REFRIGERATOR CAR CO., absorbed, 761*n*.
 ANGUS CATTLE (See "Polled Angus").
 ANTWERP, meat import, 303.
 APPERT, NICHOLAS, preserving process, 462.
 ARGENTINA, LIVESTOCK, export, consumption, 252, 254, 291, 448; American packers, 296 (See also "South America").
 ARIZONA, ANTI-TRUST CONVENTION, 248; sheep, 447; marketing, 572 (See also "Far Southwest").
 ARKANSAS, hogs, 51; cattle, 67, 440; anti-trust convention, 248; peddler cars, 401.
 ARKANSAS VALLEY LAND & CATTLE CO., 186.
 ARMOUR, A. W., Kansas City plant, 154.
 ARMOUR, C. W., Kansas City, plant, 154.
 ARMOUR, H. O., grain commission, 152; N. Y. house, 153, 388; dies, 154.
 ARMOUR, J. F., grain commission, 152; Chicago plant, 153, 154.

- ARMOUR, J. O., head of Co., 154, 166; on co-operative marketing, 669; institute program, 807.
- ARMOUR, K. B., Kansas City plant, 154.
- ARMOUR, LAWRENCE, Chicago plant, 154.
- ARMOUR, P. D., cattle dealing, 9; early career, 150; Milwaukee packing, 151, 152; Chicago grain commission, 152; Chicago packing, development, 152-154; refrigeration and dressed beef, 153, 155, 236, 237, 244, 355; brothers, 153, 154; other plants, 154, 165; by-products, 155, 357, 367, 369; character, 155; and Morris, 158, 159; pork corner, 385; denial of combination, 749 (See also "Armour and Company").
- ARMOUR, P. D., III, in management, 154.
- ARMOUR, S. B., Kansas City plant, 154.
- ARMOUR, WATSON, Chicago plant, 154.
- ARMOUR & Co., glue, 132, 357; development at Chicago, 152-154; plants elsewhere, 154, 452, 457, 458, 461; Cudahy and Co., 164; refrigerator cars, 222; South Am. plants, 296*n*; percentage of steer by-products, 348; and Chicago Board of Trade, 385; consignees, 387; branch houses, 389-392; peddler cars, 401, 402; distribution of other commodities, 409; canning plants, 466*n*; meat for army (1898), 471; pension plan, 709; industrial relations dept., 713; employee representation, 723-730; employee representation and wage reduction, 739; monopoly, 749, 773; pools, 751; Nat. Packing Co., 761, 765; deficit (1921), 781; and New Zealand, 782*n* (See also "Armour, P. D.").
- ARMOUR, H. O., & Co., 153, 388.
- ARMOUR, PLANKINTON & Co., at N. Y., 153.
- ARMOUR BROS.' BANK, 154.
- ARMOUR FERTILIZER WORKS, 367.
- ARMOUR GLUE WORKS, 357.
- ARMSTRONG PACKING Co., plant, 461.
- ARTHUR, C. A., meat investigation, 321.
- ASHWELL & Co., canning, 466*n*.
- ATCHISON, cattle market, 194.
- ATCHISON, TOPEKA & SANTA FE R. R., construction, 191; cattle road, 193.
- ATLANTA FERTILIZER FACTORY, oil refinery, 370*n*; packing, 461.
- ATLANTIC & PACIFIC R. R., construction, 191.
- ATLANTIC STATES, livestock industry passes from, 3, 41, 65, 80; droving to, 59, 64, 72, 80, 81; rail transportation to, 81, 82 (See also "New England," "South," states by name).
- AUGUSTA, oil refinery, 370*n*.
- AUSTRALIA, cattle export, 252; mutton consumption, 448; canning, 466.
- AUSTRIA, American meat, 285, 326.
- AYRSHIRE CATTLE, importation, 61.

B

- BABY BEEF, quality grades, 487*n*.
- BACKER, duty, 332.
- BACON, FRANCIS, refrigeration, 212.
- BACON, market, 117, 496; export (1920-21), 302, 304; rank of European markets, 304; British demand, Danish, 306; percentage of hog, 351.
- BACON TYPE OF HOGS, foreign demand, 305; as classification, characteristics, breeds, 490, 492.
- BACTERIOLOGICAL DEPT. OF LABORATORY, 373.
- BALTIMORE, early export, 38; western cattle at 72, 73; packing, 98; early dressed beef, 236; beef market (1921), 257; beef demands, 263; oleomargarine works, 359; fertilizer factory, 370*n*; cattle receipts (1900-21), 540; livestock exchange, 553*n*.
- BALTIMORE & OHIO R. R., opening, 81; and rate combine, 202; dressed beef, 239.
- BANKS, early meat speculation, 138, 139; livestock financing, 140, 504, 509, 520-524 (See also "Financing").
- BANTA COOLING PROCESS, 278.
- BARNES, HERBERT, and Swift, 233.
- BARRON, J. H., county agent, 662.
- BARTER, early, 45.
- BARTON, fertilizer factory, 370*n*.
- BATE, J. J., export, 275.
- BAXTER SPRINGS, cowtown, 194.
- BAXTER SPRINGS TRAIL, 177.
- BEARDSTOWN, packing, 101, 107, 108.
- BEDFORD HOG, introduction, 48.
- BEEF AND PRODUCTS, dairy cattle and quality, 256; percentage of by-products, 348-350; industry as major and by-products operation, cost accounting, 417-420; departmentization of industry, 424 (See also next titles and "Cattle," "Consumption," "Dressed Beef," "Distribution," "Export," "Meat Packing").
- BEEF BELT, 4; and cash markets, 5; significance, growth, 61-63.
- BEEF CATTLE, as classification, 259, 481, 485; breeds, 481-484; dual-purpose breeds, 484; marked classification, 484-485; grades, 486; source of dressed beef, 544.

- BEEF EXTRACT, early making, 362; Liebig's, 466.
- BEEF STEERS, percentage of dressed beef in, 349; as subclass, quality grades, 486, 487.
- BEEMER, D. B., on storage, 214.
- BEET PULP AS FEED, 259, 264.
- BELGIUM, beef consumption, 254; American meat, 282, 321; dressed beef market, 304; pork demands, 311.
- BELL, HENRY, cattle export, 271.
- BELL, JOHN, AND SONS, cattle import, 271.
- BENEFIT ASSOCIATIONS, 707.
- BENZONATED LARD, 370.
- BERKSHIRE HOGS, 48, 490, 491.
- BEVERLY, sheep center, 444.
- BIG BUSINESS (See "Monopoly").
- BILL OF EXCHANGE, in financing livestock, 140.
- BILL OF SALE DRAFT, in cattle loans, 515, 522.
- BIOCHEMIC DIVISION, co-operative work, 374.
- BIXBY, beef cattle center, 434.
- BLACKSTONE, T. B., president stockyards, 87n.
- BLAINE, J. G., AND COMPANY, restrictions on American meat, 281.
- BLISS, J. H., acknowledgment to, 410n.
- BLODGETT, H. W., decision on dressed beef, 247.
- BLOOD, products, 133, 356, 378; percentage in steers, 349.
- BLOODY RUN, Cincinnati, 119n.
- BOAGE, J. E., plant, 457.
- BOARDS OF TRADE, functions, 380; Chicago, and meat industry, 381-385.
- BOARS, packer class, 494, 496n.
- BOB VEAL, regulations, 268.
- BOHEMIANS, packer labor, 688, 689.
- BOLOGNA BULLS, subclass, quality grades, 486, 488.
- BONES, percentage of beef, 349, 350; products, 357, 368, 377.
- BONEMEAL, uses, 377.
- BORAX, use, 282, 340.
- BORLAND, W. P., meat investigation, 770.
- BOSTON, early meat supply, market regulations, 25, 27, 28, 36; packing, 98, 99; slaughtering regulations, contest, 227; dressed beef, 234, 236; beef demands, 263; cattle export, 272, 273; oleomargarine works, 359; early canning, 464; cattle receipts (1880-1921), 540 (See also "Brighton").
- BOSTON AND ALBANY RAILROAD, building, 81.
- BOSTON BEEF PACKING Co., canning, 466n.
- BOSTON BUTTS, percentage of hog, 351; as cut, 496.
- BOTSFORD, HENRY, and distribution, 409.
- BOTSFORD, H. A., & Co., dressed beef, 232.
- BOURBON COUNTY, KY., cattle fair, 5.
- BOWEN AND ENVART, packing for export, 98.
- BOXER TROUBLE, canned meat, 473.
- BOXES, making as joint products operation, cost accounting, 417.
- BOYD, J. E., plant, 456.
- BOYLE, DAVID, refrigeration, 216.
- BRANCH HOUSES, Wilson's work, 168; abroad, 312; origin, field, 387-388; development, 389; accounting system, 389; organization, scope, 390-392; financing, 391; substocks, 392; efficiency, 406; and national market, 409; wholesale grocers and, 785n (See also "Distribution").
- BRAND, C. J., zoning system, 640n.
- BRANDING AND MARKING, hog ear marks, 24, 31, 53; range, 184; and loans, 512, 514, 522; as indicating western cattle, 573.
- BRAY COOLING PROCESS, 278.
- BRAZIL, cattle, export, 252; American packers, 296 (See also "South America").
- BREEDERS' GAZETTE, on dressed beef, 249.
- BREEDING, colonial improvement, 22, 28; Merino sheep importation, 39; cattle importations, 41, 59-61, 437; creating modern hog, 48, 49, 56; failure to develop distinctly American cattle breed, 61; Morris's interest, 158; range breeds, 183, 437; effect of European demand, 284, 305; beef cattle breeds, characteristics, 481-484; dual-purpose cattle stock, 484; lard-type breeds, characteristics, 490-492; evidences, 549.
- BREEDING, LOANS, 517.
- BRIGHTON, meat industry, 27, 69, 70; market day, 70-72; slaughter house reform, regulations, concentration, 228-231.
- BRISTLES, by-product, 132, 378.
- BRITISH AND ARGENTINE MEAT Co., 296n.
- BROKERS, use, 388; and cattle paper, 520.
- BROOKS, SYDNEY, on meat situation, 298.
- BROWN, E. C., hog price control, 652, 656-658; on co-operative commission cos., 672; on meat prices, 779.
- BROWN, J. G., hog price control, 656n; president Live Stock Assn., 667n; on co-operative commission cos., 670, 671.
- BRYANT, F. J. E., stockyards officer, 87n.
- BUFFALO, meat industry, 37; livestock market, 78, 203, 206; beef market

- (1921), 257; oleomargarine works, 359; cattle receipts (1900-21), 540; livestock exchange, 553*n*; hog outlets, 581; differential in hog prices, 658.
- BULK MEAT SHIPMENTS**, 46.
- BULL PORK**, smoking, market, 117.
- BULL'S HEAD MARKET**, 5, 83, 84.
- BULLS**, packer classification, 486, 544; quality grades, 487*n*, 488, 489, 489*n*; marketing, 560-562.
- BUREAU OF AGRICULTURAL ECONOMICS**, livestock grading, 487*n*, 489*n*, 496*n*, 501*n*; on western cattle shipments, 573.
- BUREAU OF ANIMAL INDUSTRY**, establishment, importance, 188; co-operative with plant laboratory, 374 (See also "Inspection").
- BUREAU OF MARKETS**, zoning system, 639; livestock conference, 769.
- BURLINGTON PORK**, 36*n*.
- BURLINGTON STOCKYARDS**, Chicago, 85.
- BURTON, J. E.** suit, 673.
- BURTON STOCK CAR**, 199.
- BUSHARD, JOHN**, fertilizer, 356; ice machine, 357.
- BUTCHER BULLS**, subclass, quality grades, 486, 488.
- BUTCHER CATTLE** (stock), classification, grades, 259, 485, 486, 544; prices, 260; seasonal marketing, 560-562; orderly marketing, 622, 623.
- BUTCHER COWS**, subclass, quality grades, 486, 488.
- BUTCHER HOGS**, packer class, 494, 496*n*, 497.
- BUTCHERS**, division in cattle killing, 686 (See also "Slaughtering").
- "BUTCHER'S ADVOCATE,"** on dressed beef, 242, 251.
- BUTCHERS' PROTECTIVE ASSN., AND DRESSED BEEF**, 242, 243, 251.
- BUTCHERS' SLAUGHTERING AND MELTING ASSN.**, 230.
- BUTTER**, packer distribution, 406, 407, 784, 788.
- BUTTER SUBSTITUTES** (See "Oleomargarine").
- BUTTERINE**, early, 357.
- BYFIELD HOG**, 48.
- BY-PRODUCTS**, rise, 11, 348; waste disposal, 94*n*, 96, 127, 354; as the profits, 127, 347, 350, 757; and payment for slaughtering, 128; steam and utilization, 131; soap, 132, 369; glue, 132, 357; fertilizer, 132, 356, 366; bristles, 132; hair, 133, 368; chemicals, 133; gall, horn and hoofs, glycerin, gelatine, 133; Armour and development, 155; tankage, 341, 342, 396, 363; percentage in steers (chart), 348, 350; refrigeration and utilization, 355; modern packing as group of industries, 356; blood, 356; bones, granulated, 357, 368; sale of crude, brokerage, 358, 384; oleomargarine, 358-361; beef extract, 362; tallow refining, 363; pharmaceuticals, 369; chemical control and advancement, 374, 375; list of chief, 377, 378; cost accounting in operations, 412-414, 417; and determination of price of cattle, 564; packer interest in prices, 572; value (1914, 1919), 794 (See also "Hides," "Lard").

C

- C. I. F. SALES**, 313.
- CAIRO**, cattle transshipment, 177.
- CALDER, JOHN**, industrial relations department, 712-714; employee representation, 731.
- CALIFORNIA**, cattle, 67; cured pork, 117; hogs, 442; sheep, 444, 446, 447; meat industry, 460; direct marketing, 552 (See also "Pacific Coast").
- CALIFORNIA DRESSED BEEF CO.**, plant, 460.
- CALL, H. D.**, on butchers' union, 697.
- CALVES**, prices, 260; quality grades, 489*n* (See also "Veal").
- CAMBRIDGE**, soap laboratory, 370*n*.
- CANADA**, cattle, export, 252, 254, 272; ham market, 304; pork export, 308; meat consumption, 441, 448.
- CANALS**, livestock transportation, 81.
- CANNED BEEF**, export (1921), 305 (See also "Canned Meats").
- CANNED MEATS**, rise of foreign demand, 283; foreign restrictions and regulations, 285, 289, 290; unsanitary disclosures, 328; federal inspection of process and labels, 329, 339, 341, 470; first, 357; making as joint products operation, cost accounting, 417; discovery of process, 462; early American canning, 463, 464; compressed beef at Chicago, 464, 465; patent suit, 465; growth, 465; present establishments, size, list, 466; method, 467-470; test rooms, 470; embalmed beef, 470-472; foreign war and army orders, 472; demand and supply during World War, varieties, 473-476; value (1914, 1919), 794.
- CANNED PORK**, export (1921), 305 (See also "Canned Meats").
- CANNED SAUSAGE**, export (1921), 305.

- CANNER AND CUTTER CATTLE (cows), prices, 260, market, 266; packer subclass, character, 486, 488, 544; marketing, 560-562.
- CANS, manufacture, 463.
- CANTON, packing, 108.
- CANUS, M., and American meat, 288.
- CAPITAL, of early packers, 135; development, 145 (See also "Financing").
- CAPPER BILL, 531*n*.
- CAPPING MACHINES, 467.
- CAPRON, HORACE, meat inspection, 318.
- CARCASS BEEF (See "Dressed Beef").
- CAREY, PATRICK, oleomargarine, 360.
- CARPENTER, G. A., charge on beef trust, 764, 765.
- CARRIE, F. P. E., ice machine, 214.
- CASINGS, export, 305; percentage of steers, 349.
- CATTLE, colonial raising, 26, 31, 33, 34; distribution of beef and dairy (1865), 61; character of industry before Civil War, 61; Beef Belt, 61-63; classes of producers, 63, 75, 562 distribution (1840-1920, map), trend, 64-67, 432; sources during Civil War, 67; Texan, 178; demand and rail rate war (1870), 179; number in various nations, 252; since World War, 252; production and consumption areas, 432, 534; number by states (1850, 1920, maps), 433, 436; recent trend, adverse conditions, 437, elements of improvement, 438, 503; new industry in South, 440; packing follows westward trend, 451; manner of judging, 548-550; importance of branding region, 573 (See also "Beef"; "Branding"; "Breeding"; "Classification"; "Co-operation"; "Dairy Export"; "Feeder stock"; "Financing"; "Livestock"; "Marketing"; "Meat packing"; "Prices"; "Production"; "Ranges"; "Slaughtering"; "Stockers"; "Veal").
- CATTLE DRIVES (See "Droving").
- CATTLE LOAN COMPANIES, purpose, 504; size, 505; location, 505; types of loans, 506-508; commission men and banks as agents, 508-510; method, forms, 510; inquiries, inspection, 511; conditions of loan, 512-514; and cattle raisers' assns., 514; checking validity of loans, 515; margins, 515, 516; maturities, renewal, 516, 517; losses, remedies, 518, 519; interest rate, 519; disposal of paper, 519-521; distrust, 527.
- CATTLE RAISERS' ASSNS., and loans, 514 (See also "American National Livestock Assn."; "Organizations").
- CATTLE RANCH & LAND CO., 186.
- CAUL PULLER, duty, 332.
- CEDAR RAPIDS, plant, 458.
- CENTRAL TRAFFIC ASSN., and livestock rates, 203.
- CENTRALIZATION OF PACKING, influence of railroads, 107; of labor supply, 112; and distribution, 405-407; decline, 795; 800; trend toward management decentralization, 800-802 (See also "Monopoly").
- CENTREVILLE WHIP, 74.
- CHANDLER, M. W., cold transportation, 218.
- CHANDLER, P. R., pres. stockyards, 87*n*.
- CHARLESTON, colonial market, 27; early export, 35, 39.
- CHARLOTTE, test rooms, 370*n*.
- CHASE, —, refrigerator car, 222.
- CHEESE, packer distribution, 406, 407, 784.
- CHEMICALS, by-product manufacture, 133.
- CHEMISTRY, and chemical control in meat packing, importance, 11, 347; evolution, 355; early experiments, 356, 357; expert testimony, 361; regular staff, 361, 362; routine, 362; fatty acid investigation, 362; typical central laboratory, duties, 370-374; summary of work, 374, 375; and quality control, 375.
- CHERAW BACON, 35.
- CHESTER, colonial market, 31.
- CHESTER WHITE HOGS, 49, 490, 492.
- CHEVIOT SHEEP, 498, 500.
- CHICAGO, rise as livestock market, early yards, 5, 82-86, 206, 207; rise of packing, 79, 102, 107; cause of supremacy, 89-91, 120, 203; relative value of packing (1842-45), 106*n*; growth of packing, after railroad connection, 107, 109; first summer packing, 108, displaces Cincinnati, 109; early slaughtering, regulations, method, 119, 120, 125, 126; combination of slaughtering and packing, 123; early and present slaughtering capacity, 125; disposal of waste, 127; by-products and payment for slaughtering, 128; early lard products, 130; glue, 132; stability of early packing, 144; Armour's establishment, 152-154; beginning of Morris plant, 157; of Swift plant, 161, 162; beef market (1921), 256; beef demands, 264; city inspection of packing houses, 318-320; oleomargarine works, 359; typical packer laboratory, 370-374; chemical test rooms 370*n*; beginning of meat canning, 464, 465; canning companies, 466*n*; meat industry during World War, 473-478; cattle loan cos., 506, 520; cattle receipts (1870-1921),

- 540; hog outlets, 581; packer output (1919), 794 (See also next titles; and "Marketing"; "Meat packing").
- CHICAGO AND NORTHWESTERN RAILROAD, cattle road, 207.
- CHICAGO BOARD OF TRADE, defense of dressed beef, 246, 247; services to meat industry, 381-384; and small and large packers, 385.
- CHICAGO, BURLINGTON AND QUINCY RAILROAD, stockyard, 84; cattle road, 207.
- "CHICAGO JOURNAL OF COMMERCE," on packers and conserving of values, 777*n*.
- CHICAGO LIVE STOCK EXCHANGE, on dressed beef, 247; importance, 554.
- CHICAGO MEAT CO., canning, 466*n*.
- CHICAGO, MILWAUKEE AND ST. PAUL RAILROAD, cattle line, 256.
- CHICAGO PACKING AND PROVISION CO., plant, 461; canning, 466*n*.
- CHICAGO RIVER, slaughter houses, 120.
- CHICAGO UNION STOCKS YARDS, beginning, 5, 86; terminal operations, 87; early officers, 87*n*; description, 540-542; purpose of co., 541; method of handling stock, charges, 542, 543; hog dockage, 543, 554; importance and character of buyers, 544; buying system, 544-550; time of cattle arrivals, 546; method of payments, 550; process to killing, lot numbering, 551; checking up on buying, 552; method with hogs, 552; zoning system, 638-649; 2-day market system, 639 (See also "Marketing"; "Stockyards").
- CHILLICOTHE, banks and cattle feeders, 140.
- CHILLING, after slaughtering, 336.
- CHINA, pork exports, 308.
- CHISHOLM, JOHN, and trail, 177.
- CHISHOLM TRAIL, 177.
- CHUCK, percentage of beef, 350.
- CINCINNATI, as pork packing center, Porkopolis, 3, 4, 95-97; early cattle market, 78; and beef packing, 79; rivalry of eastern and southern demands, 80; beginning of packing, 93; packing advantages, 94, 95; packing for export, 97-99; yields place to Chicago, 109; slaughtering, 119-122; disposal of waste, 127; by-products, 128, 130, 132; financial advantages, 135; as later market, stockyards, rank and figures (1921), 206, 257; oleomargarine works, 359; cattle receipts (1870-1921), 540; livestock exchange, 553, differential in hog prices, 658.
- CINCINNATI PRICE CURRENT, statistics on packing, 143; on dressed beef, 243.
- CIRCLEVILLE, banks and cattle feeders, 140.
- CIST, CHARLES, packing statistics, 93, 143.
- CIVIL WAR, cattle sources during, 67; and Chicago's supremacy, 90, 91; influence on livestock industry, 175; canning meat, 464.
- CLARINDA, sheep region, 446.
- CLARK, WILLIAM, drover, 26.
- CLASSIFICATION AND GRADING, problem, 12; hogs by weight, 56; cattle "stores," 71; hogs, for droving, 73; of cured pork, 116-118; cattle, for slaughter and feeding, 259, 481; and prices, 259, 260; of beef carcasses, 261; veals, 266, 267; beef breeds, 481-484; dual-purpose breeds, 484; market classes of beef cattle, 484, 485; market classification of all cattle, 485; killing cattle quality basis, 486, 487; packer grades or sub-classes, 486; feeder and stocker quality grades, 488, 489; hog, 490, 632; lard type breeds and characteristics, 490-492; bacon type, 492, 493; market classes of hogs, 493-495; packer hog desires, 496-498; quality grades of hogs 496*n*; sheep, breeds, 498-501, 597; market classes of sheep, 501, 502; character, difficulties of cattle, 557; and fall marketing, 559 (See also "Livestock").
- CLAY, HENRY, cattle breeding, 42, 60.
- CLAY, JOHN, on cattle boom, 185; on sheep situation, 448.
- CLEAR PLATES, percentage of hog, 351.
- CLEAR PORK, weight factor, 56; requirement, 116; market, 117.
- CLEAVER, CHARLES, lard products, 130, 131.
- CLEVELAND, beef packing, 79; beef market (1921), 257; oleomargarine works, 359; fertilizer factory, 370*n*; livestock exchange, 553*n*; differential in hog prices, 658.
- CLINTON, MASS., dressed beef, 233.
- CLYBOURNE, ARCHIBALD, slaughtering and packing, 102-104, 106.
- COFFIN, SIR ISAAC, cattle breeding, 60.
- COLD STORAGE, first plant, 214; facilities, 393, 394; and sanitation, 394; of mutton, 604; govt. ownership recommended, 774; sale of packer outside interests, 783 (See also "Frozen meat"; "Refrigeration").
- COLEMAN, —, better payments, 119*n*, 128.
- COLLATERAL, in cattle loans, 513, 522.
- COLLINS, C. E., Livestock Assn. officer, 667*n*.

- COLMAN, N. J., on sanitation, 321.
- COLONIES, packing and livestock in, 3, 21-36.
- COLORADO, cattle trails, 178; cattle quarantine, 187; legislature and dressed beef traffic, 245; and anti-trust convention, 248; veal demand, 268; cattle, 435; sheep, 443, 601; cattle marketing, 573; breeding stock shortage, 619*n* (See "Far West"; "Ranges").
- COLUMBUS, banks and cattle breeders, 140.
- COLWELL, WILLIAM, cattle export, 272.
- COMMERCIAL PAPER, cattle loans, 524-528.
- COMMISSION MEN and houses in livestock marketing, rise, cash basis, effect, 6, 87-89; early packers as, 136, 141, 142; and stock at yards, selling, 542, 546-548, 550; proposed reform 661, 662; federal regulation, decision, 672-675, 789; co-operative cos., advantages, disadvantages, 670-672 (See also "Marketing").
- COMMISSION TO INVESTIGATE THE COST OF PRODUCING HOGS, 651.
- COMMONS, J. R., on division of labor, 687; on packer labor, 691.
- COMPOUND, as name for lard substitutes, 356; cottonseed oil, 365, 366, regulation, labels, 365; manufacture, 366*n*; laboratory tests, 372; value (1914, 1919), 794.
- CONCENTRATION (See "Centralization").
- CONCORD, cattle raising and settlement, 22; marking of hogs, 24.
- CONGRESS, cattle transportation laws, 198, 201; meat inspection laws, 322-324, 327; on co-operative marketing, 669; beef trust investigations and hearings, 748*n*; 749, 756, 770, 783*n*; law on immunity, 755; bills to regulate packing, packer protests, existing powers, 785-787; regulating act (1921), 787-791.
- CONNETT, S. S. and Bro., plant, 454.
- CONNECTICUT, early meat industry, 36; sheep, 447 (See also "New England").
- CONNECTICUT PORK, 36*n*.
- CONNECTICUT RIVER VALLEY, early packing, 23, 25, 26*n*.
- CONSENT DECREE, 17, 662, 783, 785.
- CONSIGNEE BUSINESS, 386, 387.
- CONSUMPTION, and production, areas (maps), 7, 432, 534, 795-797; cured pork demands, 117; meat here and abroad, 254, 255, 447, 448, 586; sectional dressed beef demands, 262-265; veal demands, 267, 268; European pork demands, 306-312 (See also "Distribution").
- COOK, DAVID, plant, 456.
- COOLEY, T. M., arbitration, 241.
- COOPER, F., on English slaughter houses, 289.
- COOPERAGE, first packing barrels at Chicago, 103, 134; coopers and packing season, 112; importance, 134; making as joint products operation, cost accounting, 417.
- CO-OPERATION, and problem of meat industry, tendency, 15, 17, 609, 676, 677, 790, 802, 809; shipping assns., 537; growth of idea, 660; conference on marketing, 660-662; county agents and farm bureaus, 662, 663; other movements, 663; Farm Bureau Federation, program, 663-665; plan of Nat. Livestock Conference, 665-668; inclusive, 668, 675; rival livestock groups, 668; packers and, 669; federal law, 669; commission cos. at stock-yards, 670-672; packing plants, 798, 799; Packers' Assn., work, 802, 803; Packers' Institute, aims, 803, 804; of livestock and packer assns., 804; of packers and retailers, meat councils, 804-806; development plan of Institute, 807, 808.
- CORNUKES, —, career, 148.
- CORN, as hog feed, 54, 55; cattle fattening, 63; crop and seasonal hog marketing, 585 (See also "Corn Belt").
- CORN BELT, and livestock markets, 207; and beef production, 207-210; seasonal marketing, 259, 561; and packing plants, 459; surplus cattle area, 556; hogs, 579; sheep, 597 (See also "Marketing").
- CORN BELT MEAT PRODUCERS' ASSN., livestock board, 675.
- CORNEBEEF HASH, during World War, 474.
- CORNERS, packers and, elimination, 385 (See also "Monopoly").
- COST ACCOUNTING, problem 12; principles of meat industry, types, 410, 411, 431; in ordinary operations, 411, 412; in major and by-product operations, 412-414; in joint product operations, 414-417; beef industry as major and by-products, 417-420; departmentization, beef, pork (charts), 423-425; departments as competitive operations, opportunity costs, 425-428; inventories, 428; elements in selling price, 429-431; for retailers, 806.
- COST OF LIVING, and packer wages (chart), 712, 721, 722.
- COTSWOLD SHEEP, 498, 500.
- COTTAGE GROVE STOCKYARD, 84.
- COTTON, and cattle raising, 67, 80, 440.

COTTONSEED CAKE, as feed, 259.
 COTTONSEED OIL, use in compound, 365; storage, 366*n*; refineries, 370*n*; industry as joint products operation, cost accounting, 415; packers retain dealing, 784.
 COUNCIL BLUFFS, cattle market, 195.
 COUNTY AGENTS, work, 662.
 COUNTY DEMONSTRATORS, work, 662.
 COW COUNTRY (See "Ranges").
 COW-PENS, in colonial Carolinas, 34.
 COWS, prices, 260; beef market, 266; packer classification, 486; quality grades for killing, 487*n*, 488; marketing, 560-562.
 COWTOWNS, rise, 194.
 CRAVEN, —, refrigeration, 277.
 CREDIT (See "Financing").
 CREAMERIES, inspection tests, 370*n* (See also "Dairy").
 CREIGHTON, beef cattle center, 434.
 CROP YEAR, beginning in beef cattle, 589; seasonal cattle marketing, 560-562; in hog marketing, 582; need of data, 627.
 CROXTON, F. C., on meat prices, 756*n*.
 CUBA, ham and lard market, 304.
 CUDAHY, E. A., as packer, 164-166.
 CUDAHY, E. A., JR., Institute program, 807.
 CUDAHY, JOHN, speculation, 385.
 CUDAHY, MICHAEL, career, 164, 165; Sioux City, 458.
 CUDAHY PACKING Co., formation, growth, plants, 164, 165, 453, 457, 458, 460; branch houses, 389; refrigerator cars, 398*n*; employee representation, 735; monopoly, 773; deficit (1921), 781 (See also "Meat packing").
 CULBERTSON, C. M., stockyards officer, 87*n*.
 CULLEN, WILLIAM, ice machine, 212.
 CUMBERLAND CUT, 117, 307, 496.
 CUNNING, E. H., Livestock Assn. officer, 667*n*.
 CURED MEATS, European restrictions on American, 281, 282, 286, 287, 290; rank of foreign markets, 304; export (1921), 305; preparation for export, 315; federal inspection, 329, 339; laboratory tests, 372; pork products storage and hog prices, 586-589 (See also "Meat packing").
 CURLED HAIR, manufacture, 368.
 CUTTER CATTLE (stock) (See "Canner and cutter").
 CUTTING MACHINE, in canning, 467.
 CYCLES OF MARKETING (See "Marketing").

D

DAGGETT, EZRA, canning, 463.
 DAIRY CATTLE, improving breeds, 61; new demand (1876), 181; increase, 255; and quality of beef, 256; packer dealing in products, 406, 407, 784, 788; dual-purpose breeds, 484; loans, 506, 507; influences on marketing for killing, 563.
 DAKOTA, cattle, 435, 437; marketing, 573 (See also "Ranges").
 DALLAS, beef demands, 264; packing, 461.
 DALLAS DRESSED BEEF & PACKING Co., 461.
 DANAHY, MATTHEW, officer Packers' Assn., 803*n*.
 DATA (See "Information").
 DAVIS, WILLIAM, refrigerator car, 218.
 DAVY, HUMPHREY, experiments, 213.
 DAWSON TRAIL, 178.
 DEAD HOGS, packer class, 495.
 DEAD MEAT, dressed beef, 276.
 DECKER, JACOB E. & SONS, plant, 458.
 DEER CREEK, slaughter houses, 119*n*.
 DEHAIRER, hog, 337.
 DELAINE SHEEP, 501.
 DELAWARE, beef demands, 263.
 DENMARK, cattle for colonial New England, 22; American meat, 281, 320, 321, 326; bacon for England, 306 (See also "Scandinavia").
 DENVER, stockyards, 204; beef market (1921), 257; beef demands, 264; packing, 460; cattle loan companies, 506; cattle receipts (1880-1921), 540; live-stock exchange, 553*n*; fall surplus cattle, 575.
 DENVER PACKING Co., canning, 466*n*.
 DEPARTMENT OF AGRICULTURE, establishment, 47; statistics, 627, 787; zoning system, 639; hog price control, 656*n*; control under Packers' Act, attitude, 788-790; retail cost accounting, 806 (See also "Bureau"; "Inspection").
 DEPARTMENTS (See "Cost accounting").
 DERBY, GEORGE, slaughtering regulations, 229.
 DETROIT, barrels for Chicago, 103; beef market (1921), 257; oleomargarine works, 359; livestock exchange, 553*n*; differential in hog prices, 658.
 DEVOE, T. F., on western cattle at New York, 73.
 DEVON CATTLE, importation, 60; range breed, 183; dual-purpose stock, 484.
 DIETARY, department of laboratory, 373.

- DISEASES, "measles," 116; outbreaks in range cattle, 187; early measure against Texas fever, 187, 188; local slaughtering and danger, 227; and restrictions abroad, 280, 281 (See also "Inspection").
- DISTILLERIES, livestock feed, 55, 63.
- DISTRIBUTION OF PRODUCTS, problem of sectional, 268; early packers not interested, 379; trading in futures, 379; Chicago prices as basic, 382; brokerage, 384, 388; wholesalers and commission men, 386; dressed beef and new agencies, 386; consignee partnerships, 386-388; department sales managers, 392; specialty men, 392; storage and delivery houses, 393; hotel supply companies, 393; cold storage, 393, 394; efficiency and need of large organizations, 405-407; packer handling of other commodities, Consent Decree, 407-409, 662, 783-785; essentials to national, 409; wartime, 476; charge of collusive selling, reply, 778-780 (See also "Boards of trade"; "Branch Houses"; "Consumption"; "Export"; "Marketing"; "Production"; "Speculation"; "Transportation").
- D'LA FONTAINE, —, chemist, 361.
- DOBSON, W. R., hog price control, 656*n*.
- DOCK, men in stockyard, 542.
- DOCKAGE OF HOGS, 543, 554.
- DODGE CITY, cowtown, 194.
- DOGIES, Texas steers, 179.
- DOLD, J. C., as head of plant, 166; Institute program, 807.
- DOLD, JACOB, career, 147.
- DOLE, G. W., packing, 102-104.
- DONNELLY, MICHAEL, strike, 699-703.
- DONOVAN, JOHN, stockyards, 454, 455.
- DORCHESTER, colonial market, 27.
- DORSET SHEEP, 498, 500.
- DOTY, —, on co-operative shipments, 538.
- DOUGLAS, J. M., stockyards officer, 87*n*.
- DOWN BREEDS OF SHEEP, 498.
- DOWNING, J. E., on livestock transportation, 196-198.
- DRAFTS, in cattle loans, 515.
- DRAYAGE, in packing, 123, 124.
- DRENNING, —, droving, 73.
- DRESSED (CARCASS) BEEF, rise of industry, Armour and Swift, 9, 155, 161, 231, 237; problems, 9, 10; federal inspection, 10, 333; opposition of railroads and stock shippers, rates adjustment, 232, 234, 237-241; opposition of local butchers, 242-245; attempted legislation against, 245-247; advantages recognized, triumph, 245, 250, 251; Chicago Board of Trade's defense, 246, 247; anti-trust assault, 248, 249; and prices to consumer, 249, 250; popularity of cuts, 260; classification of carcasses, demand, 261; characteristic carload, 262; sectional demands, 262-264; kosher trade, 265; and veal consumption, urban and rural, 265; source, 265, 544; early export, refrigeration, 275-278; preparation for export, 278; growth of export, 278; Great Britain as market, 279-283; Continental restrictions, 281, 282, 284-288; export and livestock industry, 284; wartime export, 294; export (1921), 302, 305; rank of foreign markets, 304; weight and price of cuts (chart), 350; and need of new selling agencies, 386; cost accounting, 417-420; elements in price, 429-431; army scandal (1898), 472; and price of cattle, 564; value (1914, 1919), 794 (See also "Refrigeration"; "Refrigerator car"; "Veal").
- DROVE STANDS, 74.
- DROVING, early southern, 39; hogs to market, 58, 78; to Atlantic market, grades, rates, method, 59, 72-75, 81; drovers in cattle industry, period, 64; railroads supersede, 82; from Texas before and after Civil War, 174, 175; great western trails, 177, 178; and extension of far western railroads, cowtowns, 193-195 (See also "Transportation").
- DRY HIDES, classes, 353.
- DUAL-PURPOSE CATTLE, 481, 484.
- DUNLAP, G. L., stockyards officer, 87*n*.
- DURHAM CATTLE, 42, 60, 183.
- DUROC-JERSEY HOGS, 49, 490, 491.
- DUTCH WEST INDIA Co., livestock, 27.
- DWIGHT, TIMOTHY, packer, 26*n*.
- DYER & CHAPIN, packing, 106.

E

- EAST BUFFALO, livestock exchange, 533*n* (See also "Buffalo").
- EAST ST. LOUIS, plants, 154, 163; laboratories, 370*n*; packing center, 451; cattle loan cos., 506; hog outlets, 581 (See also "St. Louis").
- EASTMAN, T. C., cattle export, 272; dressed meat export, 276-279; federal inspection, 325.
- ECKSTEIN PROCESS OF REFINING OIL, 366.
- EDINA, sheep center, 446.

EDUCATIONAL PLAN OF PACKERS' INSTITUTE, 807, 808.

EGGS, distribution by packers, 406, 407, 784, 788.

EIGHT-HOUR DAY (See "Hours").

EL PASO, beef market (1921), 257; beef demands, 264; cattle loan cos., 506.

ELLERD, H. G., on industrial relations depts., 713*n*; on employee representation, 744*n*.

ELLSWORTH, cowtown, 194; beef cattle center, 435.

ELY, E., refrigerator car, 219.

EMBALMED BEEF EPISODE and European restrictions, 284, 287; considered, 470-472.

EMPLOYEE REPRESENTATION, projected, 722; purpose, 723; forerunners, 723; Armour plan, 723-730; Swift plan, 730-734; Wilson plan, 734; Cudahy plan, 735; Dold plan, 735; union opposition, 736-738; and reduction of wages, 738-740; ineffective strike against, 740-743; effect of failure of strike, 743, 744.

EMPLOYEE STOCK INVESTMENTS, 706.

ENGINEERING SUPPLIES, laboratory tests, 372.

ENSIGN, J. D., decision on dressed beef, 247.

EQUITY LEAGUE, and co-operation, 663.

ERIE CANAL, and meat industry, 37; and livestock, 81.

ERIE RAILROAD, opening, 81; combine on stock rates, 202.

ESKRIDGE, beef cattle center, 435.

ESPUELA LAND AND CATTLE CO., 186.

EVENERS IN CATTLE RATES, 201, 202.

EVVARD, J. M., hog price control, 656*n*.

EWES, grades, 501*n*, 502.

EXCHANGE, and post-war export, 294, 295.

EXPORT OF MEAT PRODUCTS, from colonies, 23, 28, 31, 33, 35; post-Revolutionary, 36-39; pork products before Civil War, 97-99; method of packing for, 114, 115; early cattle, conditions, 157, 271-273; decline of beef, 253; amount, percentage and value (1907-21, charts), 254, 291, 299-303; development of pork products, 269; British need of meat imports, 270; later cattle conditions, 273-275, 284; frozen beef, 275; early dressed beef, refrigeration, 275-278; growth of dressed meat, 278; preparation of dressed meat for, 278; marketing dressed meat in Great Britain, 279; opposition there, regulations, 279, 280, 289; other European restrictions, tariffs, 281, 282, 284-288, 320, 321, 326; suc-

cess in Great Britain, 281-283; later of cured pork, 282; agencies in Orient, 283; effect on livestock industry, 284; wartime pork, 292, 293; wartime beef, 293; postwar, to Germany, 294, 295; to Great Britain, 295-298; pork products as main, 299; and home competition, 299, 301; of various pork products (1914-21), 301, 302; grouping of European markets, 303, 304; relative importance of products (1921), amounts, 304, 305; and hog breeding, 305; Brit. pork demands, 306-308; Continental pork demands, 308-312; present method of European payment, 310; method of traffic, 312-316; preparation of cured meats, 315; federal inspection urged, 322; federal laws for inspection, regulations, 322, 323; and embalmed beef, 472; effect on prices, 567, 589.

F

FAIRBANKS CANNING CO., 466*n*.

FAIRS, period, 5; in Ohio Valley, 75-78.

FALL RIVER, dressed beer, 235.

FALLEN hides, 353.

FALLEN TIMBERS, battle, and livestock industry, 3, 43.

FANCY MEATS, offal, 336.

FANEUIL HALL, meat market, 27.

FAR SOUTHWEST, surplus cattle area, 556; seasonal marketing, 560-562, 572, 574; comparative importance, 562 (See also states by name).

FAR WEST, beef demands, 264; sheep class, 597 (See also "Ranges"; "Western cattle"; states by name).

FARADAY, MICHAEL, experiments, 213.

FARM BUREAUS, work, 662; federation, 663.

FARMER-PACKERS colonial 25, 36; in South, 39; later, 92.

FARMERS' NATIONAL CO-OPERATIVE LIVE STOCK MARKETING ASSN., 668.

FARMERS' LIVESTOCK MARKETING COMMITTEE, acknowledgment to, 607*n*; report, 665.

FAT BACKS, percentage of hog, 351.

FATS, cost accounting, 419 (See also "Lard").

FATTENING FOR MARKET (See "Feeder stock").

FATTY ACID INVESTIGATION, 362.

FAYETTE COUNTY, OHIO, cattle region, 63.

FEDERAL LAND BANKS, and new rural credit bills, 532*n*.

- FEDERAL TRADE COMMISSION, meat investigation, character, 16, 770-773; on branch houses, 390; on efficiency of private refrigerator cars, 398; conclusions, charges, 773, 774; recommendations, 774; packers' reply, 775-781; results of report, 782, 783; and Consent Decree, 784; and supervision over industry, 786, 789.
- FEEDER AND STOCKER STEERS, as subclass, 486; quality grades, 489, 489n.
- FEEDER STOCK, colonial, 23; post-Revolutionary, 38; early corn feeding, 54, 63; hog raisers, 55; western cattle in east, 73; financing, 140, 506-508, 516, 517, 523; sources, 181, 439; and railroad extension, 195; Corn Belt operations, 207-210; seasonal marketing of cattle, 259, 559-562, 575; as cattle classification, 259, 485; cattle prices, 260; demand, 265; business methods, reform, 439, 612-621; subclasses, 486, 544; quality grades, 488, 489; sheep, grades, 501n; stockyards and movement, 543, 548, 556; as price stabilizer, 565, 576; marketing hogs, 580; marketing sheep, prices, 598-600, 603, 605; direct movement, 625.
- FEEDING STATIONS, in sheep marketing, 603 (See also "Reservoirs").
- FELIN, J. J., officer Packers' Assn., 803n.
- FELT, WILLIAM & Co., packed beef, 106.
- FERTILIZER, manufacture, 132, 356, 366-368; factories, 370n; section in laboratory, 371; making as joint products operation, cost accounting, 417; value (1914, 1919), 794.
- FIELD SUPERINTENDENT, branch house, 390.
- FINANCING, early livestock, credit system, 6, 88; commission men and cash sales, 6, 89; problem, 12; banks and early cattle, 64, 140; early in packing, payment for cattle, 135; early packer capital, 135, 145; early packers as commission merchants, 136, 141, 142; advances by eastern capitalists, 137; banks and early packer, 138; speculation then, 138, 139, 144; advances on consignments, 140; produce firms as packers, 141; burden on local packers, price fluctuations, 141-143; packing during stringency, 142; early uncertainties, 142-144; of ranges, 188; in export traffic, 310, 316; branch house, 391, rise of present method of livestock, 503; livestock organizations, 504; cattle loan companies, operations, 505-521; loan losses, remedies, 517-519; bank cattle loans, 521-524; cattle paper as commercial, 524-528; interest, 526; livestock, during postwar depression, loaning pools, War Finance Corporation, 530, 531; existing problems of livestock, longer loans, 531-533; rural credit bills, 531n; method at Chicago Stock Yards, 550 (See also "Cost accounting"; "Prices").
- FINK, —, rates on dressed beef, 241.
- FITCHBURG, dressed meat, 234, 235.
- FISHING FLEETS, meat for, 26.
- FLORIDA, wild hogs, 35; hog region, 51; cattle, 67, 68, 440; packing, 461.
- FOOD ADMINISTRATION, zoning system, 640; hog price control, 651.
- FOOT AND MOUTH DISEASE, and range cattle, 187.
- FOREST SERVICE, and cattle raising, 438.
- FORT WAYNE STOCKYARD, Chicago, 84.
- FORT WORTH, PACKING PLANTS, 154, 163, 461; beef market (1921), 257; laboratories and test rooms, 370n; cattle receipts (1900-21), 540; hog outlets, 581.
- FORT WORTH PACKING Co., 461.
- FOSTER, JAMES, cattle shipper, 174.
- FOWLER & Co., chemists, 361.
- FOWLER BROS., lard compound suit, 365; plant, 454.
- FOWLER PACKING Co., absorbed, 761n.
- FOWLER'S CANADIAN Co., absorbed 761n.
- FRANCE, cattle in, 252; decline in meat imports and consumption, 253, 254; restrictions on American meat, tariff, 281, 282, 287, 288, 320, 321, 326; oleo oil market, 304; pork demands, 311; meat consumption percentages, 441, 448; wartime canned meat demand, 475.
- FREEMAN, C. A., acknowledgment to, 110n.
- FREEMAN, L. F., hog price control, 656n.
- FRESH MEAT, monopoly of local butchers, 225; value (1914, 1919), 794 (See also "Dressed beef"; "Mutton"; "Pork"; "Slaughtering").
- FRIEDMAN MFG. Co., absorbed, 761n.
- FRONTIER, and stock raising, 35; character of hogs, 52.
- FROZEN MEAT, market for, 266; export, 275; as surplus stock, 566; and price of western cattle, 576; lamb, 604 (See also "Refrigeration").
- FULLER, F. T., hog price control, 656n.
- FULLER, MARTIN & Co., export, 278.
- FULLERS' EARTH, in refining, 363-365.
- FULTON CANNING Co., 466n.

FUNK, EUGENE, hog price control, 656n.
FUTURE DELIVERY, trading, 379.

G

G. H. HAMMOND Co. (See "Hammond Co.").
GAGE, L. J., range financing, 189.
GALL, by-product, 133.
GALLOWAY, cattle, 483.
GAMBREL, use, 121.
GARFIELD, J. R., on private refrigerator cars, 397; report on meat industry, 756-761.
GARNEAU, J. L., officer Packers' Assn., 803n.
GELATIN, by-product, 133.
GENESEE VALLEY, meat industry, 37.
GENTRY, N. H., hog price control, 656n.
GEORGIA, livestock in colonial, 35; hogs, 51, 442; new cattle interest, 440; packing, 461.
GERMANS, packer labor, 687, 689.
GERMANY, rank as market for meat products, 98, 304; cattle, 252; decline in meat imports and consumption, 253, 254; restrictions on American meat, tariff, 281, 282, 284-286, 320, 326; post-war imports, 294, 303; pork demands, 308, 309, 311; meat consumption, percentages 441, 448.
GILLETT, F. E., dressed beef, 248.
GILLETT AND SHERMAN, export, 277.
GILLETT, J. D., as cattleman, 208n.
GILMORE AND CORDUKES, 148.
GLANDS, products, 369, 370n, 378.
GLASGOW, cattle imports, 271, 272; dressed beef imports, 276, 278.
GLUE, manufacture, 132, 357; laboratory tests, 373; varieties, 377; making as joint products operation, cost accounting, 415.
GLUE HIDES, 353.
GLYCERINE, manufacture, 133, 369; laboratory tests, 372; wartime supply, 477.
GOFF, RINGOLD AND PATTON, cattle breeding, 41.
GOODNIGHT TRAIL, 178.
GOODSPEED, T. W., on Swift, 162-164.
GORMERLY, M. J., on zoning system, 646.
GOWIE, JOHN, ice machine.
GOVERNMENT OWNERSHIP of marketing instruments, recommended, 16, 774.
GOVERNMENT REGULATIONS, of meat industry desired, 17, 662, 766; of slaughtering, 28-30, 228-231; of cattle transportation, 198, 201 (See also "Export"; "Inspection"; "Packers and Stockyards Act").

GRABFIELD, J. P., chemist, 361.
GRADING (See "Classification").
GRAND TRUNK R. R., dressed beef, 234, 239.
GRANGERS, and dressed beef, 244.
GRANULATED BONE, manufacture, 368.
GRASS CATTLE, marketing, 560-562, 621; as class, 612.
GRATTAN, JOHN, hog price control, 656n.
GRANZERS, in cattle industry, 63; financing, 140 (See also "Feeding stock").
GREASE (See "Lard"; "Oleo"; "Tallow"; "Tankage").
GREAT BRITAIN, American pork in, 98, 306-308; packing for export to, 114-116; decline in meat import and consumption, 253, 254; need of meat imports, 270; cattle imports, 271-275; American dressed beef in regulations, 275-283, 288-290; slaughter houses in, 289; postwar meat demand and policy, report on trust, 295-298, 303, 773; rank as market for meat products, 304; meat consumption, percentages, 441, 447; wartime canned meat orders, 472, 473, 475.
GREECE, American meat, 281, 320.
GREEKS, packer labor, 688.
GREENVILLE, TREATY, 7; and livestock raising, 43.
GRONNA BILL, 786.
GROSSCUP, injunction, 752.
GUARANTEED TIME in packing industry, 709-712.
GUTTER, DUTY, 121, 332, 337.

H

HAAG, C. L., refrigerator car, 219.
HADLEY, settlement and packing, 23, 25.
HAIR, products from, 368, 378.
HALE, P. A., stockyards officer, 87n.
HALL, L. D., hog price control, 656-658.
HAMBURG, meat import, 303.
HAMMOND, G. H., cattle dealing, 9; refrigerator car and dressed beef, 220, 231, 232, 236.
HAMMOND Co., Omaha plant, 457; meat for army (1898), 471; monopoly, 749; absorbed, 761n.
HAMS AND SHOULDERS, as by-product 133; curing as separate industry, 134; method, 134; export (1920-21), 302, 304; rank of foreign markets, 304; British demand, 307; percentage of hog, 351; as desired cut, 496.
HAMPSHIRE HOG, 492.
HAMPSHIRE SHEEP, 498, 499.
HANCOCK, J. L., stockyards officer, 87n.
HANEY, L. H., and Consent Decree, 784n.

- HANNIBAL & ST. JOSEPH R. R., cattle road, 174, 192.
- HANNIBAL MEAT CO., canning, 466*n*.
- HANSFORD LAND & CATTLE CO., 186.
- HARLAN, C. L., on cycles of marketing, 555*n*; acknowledgment to, 607*n*.
- HARRIS & FISHER, plant, 456.
- HARRISON, sheep center, 444.
- HARTFORD, livestock center, 36.
- HARVEY, fertilizer factory, 370*n*.
- HATFIELD, settlement and packing, 23.
- HATHAWAY, HENRY, AND SWIFT, 160.
- HATHAWAY AND SWIFT, 160; cattle export, 272.
- HAUGEN ACT (See "Packers and Stockyards Act").
- HAUSER PACKING CO., plant, 460.
- HAVANA, lard trade, 97.
- HAWKINSON, J. A., hog price control, 656*n*.
- HAYES, JAMES, and strike, 743.
- HAYNES, —, chemist, 361.
- HAYS, as cowtown, 194.
- HEAVY HEIFERS, subclass, 486; quality grades, 488.
- HEAVY VEALS, grading, 266, 267.
- HEIFERS, prices, 260; quality grades for killing, 487*n*; marketing, 560-562.
- HENRY, W. A., on hog feeding, 497.
- HEREFORD CATTLE, importation, 42, 60; range breed, 183; value, 437; beef breed, characteristics, 482.
- HERRICK, C. E., on export, 299*n*.
- HIBBARD, B. H., on co-operation, 663.
- HIDE DROPPER, duty, 333.
- HIDES, in colonial Virginia, 32; not requisite of slaughterer, 133; packers and tanning, 134; percentage in steers, 349; classes and subclasses, 351-353; products from, 378; cost accounting, 419; packers and prices, 572; conditions of labor on, 692; value (1914, 1919), 794.
- HILL, WILLIAM, on cattle prices, 750*n*, 756*n*.
- HIRSH, AUGUSTUS, dressed beef, 233.
- HOG PRICE CONTROL SYSTEMS, 14, 650-659.
- HOGS, colonial industry, 22-35; marking, 24; 31, 53; as street scavengers, 38; value in West before Civil War, increase, 49, 51; trend of production (1840-1920, map), 50, 52, 441-443; droving, 51, 58, 59, 78; as small-scale industry, 51, 52; characteristics of frontier raised, 52, 53; feed and results, 53-55; class of feeders, 55; types, weight factor, demand, 55-57, 490, 496-498; importance in packing industry, 79; general decrease since World War, 252; Corn Belt and packing plants, 459; production and consumption areas, 534, 579 (See also "Breeding"; "Classification"; "Livestock"; "Marketing"; "Pork"; "Slaughtering").
- HOGSKINS, sale, 353.
- HOLMES, O. W., on meat trust, 753*n*.
- HOLSTEIN CATTLE, importation, 61.
- HOMESTEAD LAW, effect, 47.
- HONGKONG, American meat agency, 283.
- HONOLULU, American meat agency, 283.
- HOOF, PRODUCTS, 133, 378; percentage in steers, 349.
- HOOVER, HERBERT, hog price control, 656*n*; on packer competition, 781.
- HOPKINS, —, cattle diseases, 187.
- HORC & BRO., plant, 454.
- HORINE, M. F., on cattle estimate, 438*n*.
- HORNS, utilization, 133, 378; percentage in steers, 349.
- HORSEHIDES, sale, 353.
- HOTEL SUPPLY COMPANIES, 393.
- HOUGH, R. M., stockyards officer, 87*n*.
- HOURS OF LABOR, in packing industry, adoption of regular, 697, 698; guaranteed time, and eight-hour day, 709-712, 717.
- HOUSTON, D. F., zoning system, 640*n*; co-op. marketing, 661.
- HOUSTON, beef demands, 264; oil refinery, 370*n*.
- HOWARD, J. R., livestock marketing, 665.
- HUBBARD, ELBERT, on Armour and Morris, 158, 159.
- HUBBARD, G. S., packing, 103, 104.
- HULL-FEED, 259.
- HUMPHREY, J. O., opinion on immunity, 754*n*.
- HUMPHREY, L. U., dressed beef, 248.
- HUMPHREYS, DAVID, merino sheep, 40.
- HUNT, C. W., hog price control, 656*n*.
- HUNT, GEORGE, fertilizer, 367.
- HUNT, JONATHAN, farmer-packer, 26*n*.
- HUNGARIANS, packer labor, 169.
- HUNGARY, American meat, 281.
- HUTCHINSON, B. P., speculation, 385.
- HUTCHINSON, EDWARD & CO., plant, 458.
- HYDE, WHEELER & CO., dressed beef, 235.

I

- IDAHO, sheep, 443, 447; fall cattle marketing, 573, 574 (See also "Far West"; "Ranges").
- ILLINOIS, French settlers and meat industry, 42; cattle, feeding, 44, 63, 65, 67, 81, 181; hogs, 51, 442, 579, 581; droving to Atlantic markets, 72*n*; cattle markets, 78; railroads and cattle

- industry, 82; development and concentration of packing, 100, 101, 105, 107, 109; cattle transportation regulations, 198; legislature and dressed beef, 247; anti-trust convention, 248; oleomargarine works, 359; sheep, 446; co-op. shipping assns., 538; center of meat industry, 795 (See also "Chicago"; "Corn Belt"; "East St. Louis").
- ILLINOIS CENTRAL R. R., stockyard, 84.
- ILLINOIS R. R. & WAREHOUSE COMMISSION, dressed beef rates, 239*n*.
- IMMUNITY, packers' plea and decision, 754; federal law, 755.
- IMPERIAL, sheep center, 447.
- IMPORTATIONS, merino sheep, 39; cattle breeds, 41, 59, 437; hog breeds, 48; frozen beef, 266; frozen lamb, 604.
- INDIA, cattle, 252.
- INDIANA, cattle, 44, 67; hogs, 51, 442, 579; anti-trust convention, 248; oleomargarine works, 359; peddler cars, 401; sheep, 446 (See also "Corn Belt"; "Ohio Valley").
- INDIANAPOLIS, beef market (1921), 257; canning co., 466*n*; cattle receipts (1870-1921), 540; livestock exchange, 553*n*; hog outlets, 581; differential in hog prices, 658.
- INDIANS, livestock stealing, 24.
- INDUSTRIAL COMMISSION, on speculative traders, 380.
- INDUSTRIAL RELATIONS DEPTS. (chart), 712-714.
- INDUSTRIES, packing as series, 356.
- INFORMATION AND STATISTICS, and early meat industry, 143, 144; services of inspection dept., 344; of Chicago Board of Trade, 381, 382; importance, 431; function of central markets, 538; need and supply on feeder cattle, 615, 618-621; on western cattle, 624; on hogs, 627, 628; on sheep, 634, 635; need suggested, 661, 662; confidential exchange, 774, 776; program of Institute, 808.
- INSPECTION, rise of federal, 10; early, of packed meats, 118; federal and foreign restrictions, 282, 287, 290, 320, 321, 324, 326; lack in Europe, 288, 289; object, 317; periods of federal, 318; by city officers, 318-320; federal investigation of conditions (1883), 321; federal laws for export and interstate traffic, 322-324, 327; reasons for governmental, 323; regulations under federal laws, 323-325; extent and expense of early federal, 326; benefits, 326; growth, state co-operation, 327; disclosure of need in canned and prepared meats, 328; act of 1906, scope, 328; sanitary requirement, 328, 330, 336, 339, 340; method of installing, 329, 330; process with live animals, 331; with carcass beef, 333-335; with suspected or condemned carcass, 334, 336, 338; stamping, 335; with hog carcasses, 337; attitude of Bureau toward duty, 338; of prepared meats, 339, of canned meats, 340, 470; honest labels, 341; tankage, 341, 342; penalties, 342; classes of personnel, 342; extent of service, 344-346; economic importance, data services, 344; map of field, 345; in distribution, by Chicago Board of Trade, 383; refrigerator car and shipments, 396; large central markets as facilitating, 539 (See also "Government Regulation").
- INSTITUTE OF AMERICAN MEAT PACKERS, and co-operation, 17; Wilson and, 169; on exports and prices, 301; and Livestock Assn., 675, 804; origin, 803; aims, 803, 804; and retailers, 804; other work, committee, 806; development program, 807, 808.
- INSURANCE (See "Benefit Association"; "Pensions").
- INTEREST, on cattle paper, 519, 526; of War Finance Corporation loans, 530.
- INTERNATIONAL & WELLS PACKING CO., meat for army (1898), 471.
- INTERNATIONAL PACKING CO., and speculation, 385; at Sioux City, 458.
- INTERSTATE COMMERCE, control and dressed beef traffic, 247; and stockyards, 673-675, 789*n*.
- INTERSTATE COMMERCE COMMISSION, livestock rates, 537; packer distribution methods, 785*n*.
- INTESTINES, products, 378.
- INVENTORIES, elements, 428.
- IOWA, cattle, feeder stock, 47, 67, 78, 181, 613; hogs, 51, 442, 443, 579; anti-trust convention, 248; peddler cars, 400; packer handling of other commodities, 407; sheep, 446; packing plants, 457-459; co-operative shipping assns., 538; hog marketing, 581 (See also "Corn Belt").
- IRELAND, pork products, 308.
- IRISH, packer labor, 687.
- IRISH, Grazier hogs, 49.
- ITALIANS, packer labor, 688.
- ITALY, decline in meat imports, 253; Am. meat, 281, 320, 326; pork demands, 311; wartime canned meat demand, 475.

J

- JACKSONVILLE, packing, 461; livestock exchange, 553*n*.
 JACOB DOLD PACKING Co., origin, 147; Wichita plant, 454; meat for army (1898), 471; industrial relations dept., 713; open shop, employee representation, 735.
 JAPAN, meat, 283.
 JARVIS, WILLIAM, merino sheep, 40.
 JEFFERSON, THOMAS, merino sheep, 39.
 JERSEY CATTLE, 61.
 JERSEY CITY, beef market (1921), 257; beef demands, 262; dressed meat export, 277, 278; cattle receipts (1900-21), 540; livestock exchange, 553*n*; sheep market, 598; koshered meat, 639.
 JERSEY RED HOG, 49.
 JEWS, beef trade, 265, 639; veal trade, 268.
 JOBBING system, meat distribution, 386, 388.
 JOBBINS, —, tankage, 363.
 JOHN MORAN PACKING Co., plant, 454.
 JOINT PRODUCTS, cost accounting in operations, 412-414, 417, 421-423.
 JOSLIN, O. T., chemist, 361; tankage, 363.
 JOWL BUTTS, percentage of hog, 351.
 JOY, J. F., stockyards officer, 87*n*.

K

- KANSAS, cattle, feeder stock, 47, 67, 181; hogs, 51, 443; cattle trails, cowtowns, 177, 194; quarantine, 187; legislature and dressed beef, 245; anti-trust convention, 248; peddler cars, 400; packer handling of other commodities, 407; sheep, 447; seasonal marketing, 560, 573; breeding-stock shortage, 619*n* (See also "Corn Belt").
 KANSAS CITY, establishment of packer plants, 154, 163, 452-454; cattle market, stockyards, 194, 203-206; livestock exchange, 205, 553*n*; early dressed beef, 231; beef market (1921), 256; beef demands, 264; oleomargarine works, 359; laboratories, test rooms, 370*n*; canning co., 466*n*; cattle loan cos., 506; cattle receipts (1870-1921), 540; disposal of fall surplus cattle, 575; stocker and feeder pigs, 580; hog outlets, 581; differential in hog prices, 658.
 KANSAS CITY CAR Co., absorbed, 761*n*.
 KANSAS CITY FT. SCOTT & MEMPHIS R. R., livestock freight, 193.
 "KANSAS CITY JOURNAL," on Livestock exchange, 554.

- KANSAS CITY PACKING Co., 453.
 KANSAS LIVESTOCK ASSN., and Livestock Board, 675.
 KANSAS PACIFIC R. R., cattle line, 192.
 KEARNEY, laboratory, 370*n*.
 KENSETT, THOMAS, and canning, 463.
 KENTUCKY, cattle breeding, 41, 42; hogs, 51, 441, 442; market fairs, 75-78; peddler cars, 400, 401 (See also "Ohio Valley").
 KENYON BILL, 785.
 KERBER, C. A., officer Packers' Assn., 803*n*.
 KERRY, cattle importation, 61.
 KINGAN, SAMUEL, cattle dealing, 9; career, 148.
 KINGAN, T. D., refrigeration, 215.
 KINGAN & Co., packing plant, 453; canning plant, 466*n*.
 KNOX, P. C., meat trust, 752.
 KOHRS, CONRAD, cattleman, 187.
 KOSHER (See "Jews").
 KOSHER Cows, subclass, 486; quality grades, 488.
 KRUG, HENRY & Co., plant, 454.
 KUHN, LOEB & Co., and meat merger, 761.

L

- LABELS, inspection, 341.
 LA BLANCA Co., American owned, 296*n*.
 LABOR, in meat industry, problem importance, 15, 681; wages (1850-70), 99; supply for early winter packing, hours then, 111, 112; early division, 121, 122; present specialization, 681-683; extent of division, gains, 683-687; nationalities, 687-689; woman, 689, 690; conditions and life before 1904, 690-694, 698, 699; unionization, gains, 694-699; early strikes, 699; strike of 1904, effect on union, 700-705; betterment plan, 705; stock investments, 706; welfare work, 706, 707; benefit assns., pensions, 707-709; guaranteed time, 709-712; wartime conditions, wages, 712, 719; industrial relations depts., 712-714; wartime reassertion of unions, 715, 716; President's Mediation Commission, report, 716-718; packers' opposition to unions, 716, 735, 737, 743; federal administrator, postwar continuation, 718-722, 736; postwar readjustment, wages (chart), 720-722, 736; employee representation, plans, working, 722-736; union opposition to it, 736-738; employee representation and reduction of wages, 738-740; strike (1921), effect of failure, 740-744.

- LABORATORIES, typical central packing-house, 370; location of branch, 370*n*; analytical and testing dept., 371-373; research, 373; dietary dept., 373; bacteriological dept., 373.
- LABORATORY INSPECTORS, class and duties, 342, 343;
- LABRADOR, cured beef, 304.
- LAKE SHORE & MICHIGAN SOUTHERN R. R., opening, 81; stockyards, 84.
- LAMBS, grades, 501*n*, 502 (See also "Sheep").
- LANCASTER, beef market (1921), 257.
- LANDIS, K. M., beef trust, 762.
- LANE, DENNIS, strike, 743.
- LARD, development of export, 97; price and shoulder trimming, 116, 129; poorer grades, development of uses, 129-131; rendering as separate business, 129, 131; steam rendering, improvement, 131, 358; export (1913-21), rank, 301, 304; rank of foreign markets, 304; Chinese export, 308; percentage of hog, 351; early refining, 364; leaf and mixed, 364; compounds, cottonseed, 365, 366; departments in modern refinery, 366*n*; value (1914, 1919), 794.
- LARD COMPOUNDS, export (1921), 305.
- LARD OIL, demand, and fat hogs, 57; as illuminant, manufacture, 97, 130.
- LARD STEARIN, 364.
- LARD, TYPE OF HOGS, and export, 305; as classification, characteristics, breeds, 490-492.
- LAY INSPECTORS, class and duties, 342, 343.
- LAYTON, FREDERICK, AND PLANKINTON, 149.
- LAYTON & PLANKINTON, 149; Cudahy and, 164.
- LEAVENWORTH, cattle market, 194.
- LEAVITT, WELLINGTON, acknowledgment to, 543*n*.
- LEES, HENDRICKS Co., canning, 466*n*.
- LEGGER, duty, 332.
- LEICESTER, sheep, 498, 501.
- LENROOT BILL, 531*n*; 532*n*.
- LEWIS, —, farmer-packer, 25.
- LEXINGTON, candle and soap factories, 129.
- LIBBY, MCNEILL AND LIBBY, canned beef, patent suit, 465; meat for army (1898), 471.
- LID-STITCHING, 58.
- LIEBIG, BARON VON, canning, 466.
- LIGHT HOGS, class, 494.
- LINCOLN, ISAAC, hog price control, 656*n*.
- LINCOLN, sheep, 498, 501.
- LINDE, C. P. G. V., refrigeration, 215.
- LITHUANIANS, packer labor, 688, 689.
- "LITTLE PURPLE STAMP," 335.
- LIVERPOOL, cattle imports, 272; dressed meat imports, 275-278.
- LIVESTOCK, supply and consumption (map), 6-8, 534; westward trend of industry, packinghouses follow, 21, 795; in early New England, 21-27, 36; in middle colonies and states, 27, 28, 30, 31, 38; in South, 31, 35, 38, 39; as frontier industry, 35; Genesee Valley, 37; Transfer to Ohio Valley, 40-43; period in Indiana and Illinois, 44; in Missouri, 45; western and lack of transportation, 45; area before Civil War, and agricultural revolution, 47, 75, 80; producers before Civil War, 63, 69, 75; and development of trunk lines, 81, 82, 191-195; Morris's and Swifts's interests, 157, 160; demand after Civil War, 173, 175, 190; rise of Texas industry, 173-175; shippers and dressed meat traffic, 232, 238; producers and packers, 769, 804; value of slaughtered (1914, 1919), 794 (See also "Breeding," "Cattle," "Classification," "Corn Belt," "Diseases," "Export," "Financing," "Hogs," "Marketing," "Meat Packing," "Sheep," "Slaughtering," "Transportation").
- LIVESTOCK EXCHANGES, development, 205; and stockyard payments, 550; importance, 553; list, 553*n*; functions, 554.
- LIVESTOCK FINANCE CORPORATION, services, 529.
- LIVESTOCK SHIPPERS' ASSN., co-operative, 537; and hog reservoirs, 632.
- LIVINGSTON, R. R., merino sheep, 40.
- LOADING DAY (See "Zoning").
- LOAN AGENCIES under War Finance Corporation, 530.
- LOANS (See "Financing").
- LOINS, percentage of hog, 351; desired cut, 496, 497.
- LOMAX, J. A., cowboy anthology, 183.
- LONDON, cattle imports, 272; dressed meat imports, marketing, 278, 279, 283.
- "LONDON MEAT TRADES' JOURNAL," on American meat, 282.
- LONG AND SHORT MIDLINGS, 118.
- LONG-FED CATTLE, seasonal marketing, 561, 562.
- LONGHORN cattle, Texan, 178.
- LOOMIS, SILAS, on livestock distribution, 7, 64.
- LOS ANGELES, packing, 460; cattle loan cos., 506; stockyards, 552.
- LOUISIANA, hogs, 51; cattle, 67, 440.

LOUISVILLE, pork packing, 96; beef market (1921), 257; oleomargarine works, 359; livestock exchange, 553*n*; cattle receipts (1900-21), 540.

LOWELL, dressed beef, 235.

LOWES, beef cattle center, 434.

LYMAN, A. S., refrigerator car, 219.

LYNN, colonial market, 27.

M

McARTHUR, DUNCAN, cattle breeding, 60.

McCARTHY, G. L., officer Packers' Assn., 803*n*.

McCoy, J. G., railroads and livestock, 192, 193.

McCREA, A. L., refrigerator car, 219.

McCULLOUGH, J. N., officer stockyards, 87*n*.

MacDOWELL, C. H., tankage, 367; soap, 369.

McFADDEN, W. M., hog price control, 656*n*.

McGEOGH, EVERINGHAM & Co., lard suit, 365.

McLAUGHLIN, A. C., on social change, 676.

MADISON, JAMES, merino sheep, 39.

MADISON COUNTY, ILL., packing, 100.

MADISON COUNTY, OHIO, cattle fair, 5, 75; cattle region, 63.

MAYHARD, JOHN, JR., packer, 93*n*.

MAIR, ROBERT, hog price control, 656*n*.

MAKING THE DAILY MARKET, charge and answer, 774, 777.

MANILA, American meat agency, 283.

MANN, A. G., chemist, 361; fertilizer, 367.

MANWARING, —, pharmaceuticals, 361.

MARGARINE, development, 311.

MARGINS IN CATTLE LOANS, 515, 516.

MARKET PIGS, packer class, 494, 496*n*.

MARKETING OF LIVESTOCK, fairs, 5, 75-78; beginning of centralized cash, 5, 87-89; marketmen and development of packing, 9, 157, 160; problem of modern, 13-15, 556, 606, 626, 637; early eastern, 26, 28, 30, 31, 36; hog, before Civil War, method, results, 57, 58; later eastern, 69; Brighton Market, 69-72; development of central, 78; causes of Chicago's supremacy, 89-91, 203; uncertainty of receipts, 143; development of trans-Mississippi, Kansas City, 104, 203-206; livestock exchanges, 205, 553, 554; St. Louis and Cincinnati, 206; Chicago about 1884, 206, 207; and Corn Belt, 207; relative rank of markets (1921, chart), 256-

259; field elements, 534; possible methods, 535; factors in central and local, percentages, 535, 535*n*, 555; classes of shippers, co-operative assns., 537; functions of central markets, packers and, 538, 539; table of receipts at central markets (1870-1921), 540; direct, 552, 581, 625; cattle cycles, importance, 555, 610; lack of relation of number of cattle to shipments, 557-559; fall cattle, proportion of classes, 559; quarterly divisions in cattle, 559; beginning of cattle crop year, 559; average seasonal cattle receipts, character, disposal, 559-562; comparative importance of sources, 562; movement by classes of producers, 562; determination of cattle prices, 563-567; relation of cattle receipts to prices, 567; long-time and short-time movements, fluctuations and prices, 568-571, 577, 608; packers and cattle prices, 571, 572; western cattle, disposal of fall surplus, 572-576; western cattle price determination, time and place problem, 576-578; purposes of hog, outlets, 580; hog characteristics influencing, 581, 582; relation of number of hogs to shipments, "crop," 582; beginning of hog crop year, 582, 583; trimester handling of hog crop, corn crop and, 583-585; determination of hog prices, 585-591; packers and hog prices, 591, 592; hog receipts and prices, 592; hopes from better hog, 593-596; sheep outlets, 598; sheep cycle, 599-603; relation of number of sheep to shipments, 601; factors in sheep prices, 603, 604; prices and receipts, uniformity of sheep receipts, 604, 605; general defects, ignorance of supply, 607; failure to correlate supply and demand, 608; short-time distribution, 608; possibility of improvement, 609-611; conditions for orderly: of feeder cattle, 612-621; of grass cattle, 621, 622; of butcher and stocker cattle, 622, 623; of western cattle, 623-625; need of hog statistics, 627, 628; orderly hog, market and reservoir methods, 629-634; control of hog market, 630; orderly sheep, 634-636; Chicago zoning system, purpose, effect, 638-650; wartime hog price control, 650-659; national conference suggestions, 660-662; constant percentage of big packer purchases and monopoly charge, 765, 766, 772*n*, 773, 775, 776; govt. control of instruments recommended, 774; other charges against big packers, reply, 774,

- 776-778; regulation under Packers and Stockyards Act, 788, 789 (See also "Boards of Trade," "Classification," "Commission Men," "Co-operation," "Distribution," "Export," "Information," "Livestock," "Prices," "Stockyards," "Transportation").
- MARKING (See "Branding").
- MARSH, SYLVESTER, packing, 102*n*, 104, 119.
- MARSHALL, F. R., hog price control, 656*n*.
- MARTIN, S. W., beef trust, 756.
- MARYLAND, early meat industry, 23, 30; beef demands, 263.
- MASH, livestock feed, 54, 55, 63.
- MASON, JOHN, and cattle, 22.
- MASON CITY, packing plant, 458.
- MASSACHUSETTS, livestock in colonial, 21; cattle breeding, 59, 61; later lack of cattle, 65; State Board of Health and slaughtering, 228; and lard compounds, 365; direct marketing, 553 (see also "Boston," "New England").
- MATADOR LAND AND CATTLE CO., 185, 186.
- MATHER, A. C., stock car, 200.
- "MATIN," on French meat, 288; on American army refrigeration plant, 478.
- MATURITIES, of cattle loans, 516, 517, 523; War Finance Corporation loans, 530; need of longer, 531, 532.
- MAYER, O. G., institute program, 807.
- MEASLES, in pork, 116.
- MEAT COUNCILS, origin, purpose, national assn., 805.
- MEAT INSPECTION ACT, 1906, 328.
- MEAT PACKING, early in east, 3, 23, 25, 31, 33, 39; as inclusive term, 3, 46, 118; rise in Ohio Valley, Cincinnati, 3, 4, 93-95; basis of middle west industry, 5; factors in modern industry, 6, 9; and livestock industry, 9, 157, 160, 769, 804; problems, 11-17; in colonial Illinois, 42; early forms, 46; at Brighton, 70; comparative pork and beef, 79, 173; on western farms, 92; growth of industry (1850-70), 99; development in Illinois, 100, 101, 105; at St. Louis, 105; development in Chicago, supremacy, 102-107, 109; summer, 108; railroads and concentration, present decentralization trend, 107, 112, 405-407, 539, 795, 800-802; winter, 110, 111; early houses, 113; pickle tanks, 113; merchants, 113; method, influence of export, 114-117; and slaughtering, economics, 123, 124; drayage, 123; co-operation, 134; pioneer packers: Dold, 147; Cordukes, 148; Kingan, 148; Plankinton, 149; Armour, 149-156; Morris, 156-159; Swift, 159-164; Cudahy, 164, 165; Wilson, 166-169; essentials (1870) for further development, 211, 379; effect of refrigerator car, 222, 224; modern complexity, 356, 681-683; unrelated lines divorce, 407-409, 661, 662, 783, 784; westward trend, 451, 795; establishment at: Kansas City, 452-454; St. Joseph, 454, 455; Omaha, 456, 457; Sioux City, 457; other Iowa plants, 458, 459; other centers, 459-461; wartime mobilization, 473-478; purchase for, described, 543-548; no new big packers, 781; effect of Federal Trade Commission's report, 782, 783; as big business, value of output, 792-794; relation of local and national, 797; future, 809 (See also "Beef," "By-Products," "Canned Meats," "Chemistry," "Co-operation," "Cured Meats," "Distribution," "Export," "Financing," "Frozen Meat," "Government Regulation," "Inspection," "Labor," "Livestock," "Monopoly," "Mutton," "Pork," "Refrigeration").
- MECHANICAL DEVICES, in slaughtering, improvements, 124, 126.
- MEDICAL DEPARTMENT, plant, 706.
- MEDIUM WOOL BREEDS OF SHEEP, 498-501.
- MEDIUM-FED CATTLE, marketing, 561.
- MEER, ARTHUR, hog price control, 656*n*; Institute program, 807.
- MEGE-MOURIES, —, oleomargarine, 358.
- MEMPHIS, test rooms, 370*n*.
- MERCER, J. H., hog price control, 656*n*.
- MEREDOSIA, packing, 101.
- MERGER, proposed, 761.
- MERINO SHEEP, importation, 39; breeds, characteristics, 498, 501.
- MERRILL, E. R., on stock car, 199*n*.
- MERRIMAC VALLEY, cattle raising, 25.
- MESS PORK, requirement, market, 116, 117.
- METCALF, GEORGE, and Plankinton, 148.
- MEXICO, dressed beef, 304.
- MEYER, EUGENE, JR., on livestock loan cos., 531; Capper bill, 531*n*.
- MIAMI VALLEY, Poland-Chinas, 491.
- MICHIGAN, cattle, 47; hogs, 51, 442; peddler cars, 401; sheep, 443, 446, 447.
- MICHIGAN CENTRAL RAILROAD, stockyard, 84; and cold transportation, 217; early dressed beef shipments, 234.
- MICROSCOPIC PORK INSPECTION, 325, 326.
- MIDDLEMEN, as packers, 141; elimination, 406 (See also "Distribution").
- MILEAGE, rental of private freight cars, 399.

- MILES, F. B., and Armour, 151.
MILES, N. A., embalmed beef, 471.
MILK VEALS, grading, 266, 267.
MILLER, HENRY, cattleman, 187.
MILLER AND LUX, cattle co., 187; and eastern dressed beef, 460.
MILLS, ELISHA, packer, 4, 93.
MILWAUKEE, Plankinton and Armour, 148-152; beef market (1921), 257; beef demands, 264; livestock exchange, 553n; differential in hog prices, 658.
MINERAL POINT PASTURE REGION, 621.
MINING, and ranges, 176.
MINNEAPOLIS, beef demands, 264.
MINNESOTA, hogs, 51, 442; cattle, 67; legislation against dressed beef, unconstitutionality, 247; anti-trust convention, 248; co-operative shipping assns., 538 (See also "St. Paul").
MISSISSIPPI, hogs, 51; cattle, 67, 440.
MISSISSIPPI RIVER, cattle transportation, 177.
MISSOURI, cattle, 45, 67; early packing, 79; legislature and dressed beef, 245; anti-trust convention, 248; peddler cars, 400; packer handling of other commodities, 407; hogs, 442, 443, 579 (See also "Corn Belt," "Kansas City," "St. Joseph," "St. Louis").
MISSOURI PACIFIC RAILROAD, cattle line, 174.
MISSOURI VALLEY PACKING Co., plant, 454.
MONDAY, as livestock marketing day, 569, 609, 638 (See also "Zoning System").
MONOPOLY IN MEAT INDUSTRY, importance of question, 16, 745, 766; resolution of interstate convention against (1889), 248, 249; first investigation (1890), 249, 748-752; British investigation, 296-298, 773; efficiency and need of large-scale marketing, 405-407, 747-749; development of industry, classes, 745-747; attempted indictments (1895), 752; (1919), 782; Grosscup injunction, 752; indictment (1905), immunity bath, 753-755; and complaint on prices, 755; Garfield report, 756-761; proposed merger, 761; holding company civil indictment, 761, 762; criminal prosecution, acquittal, 763, 764; main basis of charge, constant percentages of livestock purchases, 765, 766, 773, 775, 776; and desire for govt. regulation, 766; charges of livestock producers, 768, 769; proposed investigation (1916), 770; Federal Trade Commission investigation, 770-781; consent decree, sale of outside holdings, 783-785; agreement against combinations, 784; Packers and Stockyards Act, on, 788; packing as big business, 792.
MONTANA, veal demand, 268; cattle, 437; sheep, 446, 447; fall cattle marketing, 573; breeding-stock shortage, 619n (See also "Far West," "Ranges").
MONTEVIDEO, Liebig's plant, 466.
MOODY, W. H., immunity bath, 754.
MONTGOMERY, livestock exchange, 553n.
MORMONS, and ranges, 176.
MONELL, JOHN, & Co., plant, 458, 459.
MORRILL, CHESTER, packers administrator, 789.
MORRILL ACT, influence, 47.
MORRIS, EDWARD I. AND WILSON, 168.
MORRIS, EDWARD, II, head of plant, 166, 168; Institute program, 807.
MORRIS, NELSON, cattleman, 9, 158; career and growth of packing plant, 156, 157; cattle export, 157, 271; and Armour, 158, 159; refrigerator car, 221, 222; dressed beef export, 275; and chemists, 361.
MORRIS, NELSON, II, head of plant, 166, 168.
MORRIS & Co., founder, development, 156-159; services of Wilson, 166-168; branch houses, 168, 389; S. Am. plants, 296n; use of consignees, 387; branch plants, 453, 455, 460; meat for army (1898), 471; pensions, 708; pools, 751; Nat. Packing Co., 761, 765; and monopoly, 773; deficit (1921), 781.
MORRIS AND SHERMAN, export, 278.
MORSE, L. V., stockyards, 205.
MORTON, J. S., meat trust, 752.
MOTOR TRUCKS, meat distribution, 403, 404.
MOULTRIE, packing, 461.
MOUNTAIN MUTTON SHEEP, breeds, 500.
MUCREDUS, LATIMUS, refrigeration, 212.
MUMFORD, H. W., acknowledgment to, 555n.
MURRAY, J. J., oleomargarine, 360.
MUSEUM, Institute, 808.
MUSICAL STRINGS, by-product, 378.
MUTTON AND LAMB, export rank (1921), amount, 278, 305; present Brit. Empire conditions, 296; variability of consumption, 447; chief consuming nations, 448; as purpose of sheep production, breeds, 498-501, 597, 598, 601; value of fresh (1914, 1919), 794; frozen, import, 604 (See also "Sheep").

N

- NAPHTHA EXTRACTION OF TANKAGE, 363.
- NASH, S. T., hog price control, 656*n*; Institute program, 807.
- NASHVILLE, livestock exchange, 553*n*.
- NATIONAL AGRICULTURAL CONFERENCE, hog statistics, 626*n*; meeting, 662.
- NATIONAL ASSN. OF MEAT COUNCILS, 806.
- NATIONAL CATTLE GROWERS' ASSN., organization, convention, 188.
- NATIONAL CATTLE TRAIL, proposed, 188*n*.
- NATIONAL CONFERENCES ON MARKETING AND FARM CREDITS, 660.
- NATIONAL LIVESTOCK AND MEAT BOARD, membership work, 675, 676, 804.
- NATIONAL LIVESTOCK CONFERENCE, plan, 665-667.
- NATIONAL LIVESTOCK EXCHANGE, 553.
- NATIONAL LIVESTOCK PRODUCERS' ASSN., work, 15, 667, 670.
- NATIONAL PACKING CO., holding company, civil indictment, 761, 762; criminal case, 763, 764; dissolved, 765.
- NATIONAL PROVISIONER, data of livestock purchases, 776; on conserving livestock prices, 777*n*; on decentralization, 800.
- NATIONAL SWINE GROWERS' ASSN., livestock board, 675.
- NATIONAL WOOL GROWERS' ASSN., Livestock Board, 675.
- NATIONALITIES, in packing industry, 687-689.
- NATIVE BEEF, prices, relative value, 260; demand, 266; as class, 484, 611; marketing reform, 612-622.
- NATIVE SHEEP, as class, 597; marketing, 599-603, 605, 634.
- NAVY, pork for, 117.
- NEATSFOOT OIL, 129, 130.
- NEBRASKA, cattle, feeding, 47, 67, 131; hogs, 51, 443, 579; anti-trust convention 248; oleomargarine works, 359; cattle marketing, 573; sheep, 601 (See also "Corn Belt").
- NECKMAN, duty, 333.
- NEGROES, packer labor, 688.
- NELSON, E. K., chemist, 361.
- NELSON MORRIS AND CO., (See "Morris and Co.").
- NETHERLANDS, market for meat products, 304; pork demands, 311.
- NETTLETON, G. H., stockyards officers, 205*n*.
- NEUTRAL LARD, foreign markets, 304.
- NEVADA, sheep, 447; cattle marketing, 573, 574 (See also "Far West").
- NEW AMSTERDAM, slaughtering, 28.
- NEW BRITAIN, dressed beef, 235.
- NEW ENGLAND, early meat industry, export, 3, 23, 25, 26, 36, 37; early livestock, 21, 22, 24-26; sheep importations, 40; cured pork market, 117; beef demands, 263; later hogs, 442 (See also states by name).
- "NEW ENGLAND MAGAZINE," on cattle ship, 273.
- NEW HAMPSHIRE, cattle, 65; sheep, 447 (See also "New England").
- NEW HAVEN, meat export, 36; pork packing, 98; dressed beef, 235.
- NEW JERSEY, beef demands, 263 (See also "Jersey City").
- NEW LONDON, meat export, 36; dressed beef, 235.
- NEW MARKET CO., plant, 460.
- NEW MEXICO, cattle trail, 178; anti-trust convention, 248; cattle, 437; sheep, 446, 447; breeding-stock shortage, 619*n* (See also "Far Southwest").
- NEW NETHERLANDS, livestock, 27.
- NEW ORLEANS, early meat trade, 42-45; river cattle transportation, 177; beef market (1921), 257; veal demand, 268; livestock exchange, 553*n*.
- NEW YORK, early meat industry, 28, 37; beef demands, 263; hogs, 441; sheep, 444, 446, 447.
- NEW YORK AND TEXAS BEEF PACKING CO., 216*n*.
- NEW YORK CENTRAL RAILROAD, building, 81; combine on rates, 202; and dressed beef, 239.
- NEW YORK CITY, early meat industry, 28-30, 37; hogs as scavengers, 38; western cattle at, 73; pork packing, 98; Armour house, 153; slaughter house regulations, 227, 228; beef market (1921), 257; beef demands, 262, 266; imported frozen beef, 266; bob veal, 268; dressed meat export, 275, 276; oleomargarine works, 359; canning, 464; cattle receipts (1880-1921), 540.
- NEW ZEALAND, meat export, 252; mutton consumption, 448; canning, 466; frozen lamb, 604; and American packers, 782*n*.
- NEWBERRY, OLIVER, and Dole's meat packing, 103; slaughter house, 104.
- NEWBERRY & DOLE, speculation, 139.
- NEWCASTLE, DELAWARE, early market, 31.
- NEWCASTLE, N. H., fair, 27.
- NEWELL STOCK CAR, 199.
- NEWFOUNDLAND, cured beef, 304.
- NEWMAN, V. A., on cattle loans, 504*n*, 509, 521.
- NEWSPAPERS, market, sale of packer interests, 783.
- NEWTON, cowtown, 194.

NICHOLSON, JOSEPH, refrigerated warehouse, 355.
 NOBLE, JOHN AND MARK, slaughter house, 103.
 NOFSINGER, F. B., at Kansas City, 452.
 NOFSINGER AND COMPANY, dressed beef shipments, 231, 232*n*; plant, 452.
 NON-PARTISAN LEAGUE, co-operative, 663.
 NORTH CAROLINA, early livestock and meat industry, export, 26, 33, 34, 39; later hogs, 51, 442.
 NORTH DAKOTA (See "Dakota").
 NORTHAMPTON, early packing, 26*n*.
 NORTHERN PACIFIC RAILROAD, construction, 191; cattle transportation, 199.
 NORTHWESTERN UNIVERSITY, and assn. of meat councils, 805.
 NORWAY, market for meat products, 304 (See also "Scandinavia").
 NORWICH, meat export, 36.
 NOYES, W. H., consignee partnerships, 388.
 NYE, GEORGE AND Co., dressed beef, 236.

O

OFFAL, modern disposal, 336; value of edible (1914-1919), 794 (See also "By-Products," "Tankage").
 OHIO, cattle, 43, 63; hogs, 51, 441, 442; cattle breeding, 60; eastern droving, 72-74; legislature and dressed beef, 245; anti-trust convention, 248; oleomargarine works, 359; peddler cars, 401; sheep, 443, 444, 446, 447 (See also "Cincinnati," "Corn Belt," "Ohio Valley").
 OHIO VALLEY, as livestock region, period, 3, 42, 43, 65, 80; fairs, 75-78.
 OKLAHOMA, cattle trails, 177, 178; peddler cars, 400; cattle, 435; marketing, 560, 573 (See also "Far Southwest").
 OKLAHOMA CITY, beef market (1921), 257; packing, 460; cattle loan cos., 506; livestock exchange, 553*n*.
 OLD SHAWNEE TRAIL, 177.
 OLEO OIL, export (1921), amount, foreign markets, 304; vegetable fat competition, 311; percentage in steers, 349; value (1914, 1919), 794.
 OLEOMARGARINE, export (1921), amount, 305, 359; invention, 358; American development, 359, 360; growth in Europe, 360; patent controversies, 360; making as joint products operation, cost accounting, 417; value (1914, 1919), 794.
 OLEOMARGARINE MANUFACTURING Co., 359.

OMAHA, cattle market, stockyards, 194, 195, 204, 455; beef market (1921), 256; beef demands, 264; oleomargarine works, 359; early packing houses, 455; South Omaha establishments, 456; cattle loan companies, 506; cattle receipts (1880-1921), 540; livestock exchange, 553*n*; fall surplus cattle, 575; hog outlets, 581; differentials in hog prices, 658.
 OMAHA PACKING Co., canning, 466*n*; absorbed, 761*n*.
 OPERATING DIVISION, quality control, 376, 377.
 OPPENHEIMER MANUFACTURING Co., casings, 753*n*.
 OPPORTUNITY COSTS, 426-428.
 OREGON, cattle, 67; sheep, 447 (See also "Pacific Coast," "Portland").
 OREGON SHORT LINE, construction, 191.
 ORGANIZATIONS FOR MARKETING, proposed: feeder cattle, 620; grass cattle, 622; western cattle, 624-626; use of existing, 625; hog, 632, 633; sheep, 634, 635 (See also "Co-operation").
 ORIENT, demand for American meat, 283.
 OSAGE, pasture region, 621.
 OSAKA, American meat agency, 283.
 OTTUMWA, packing, 458, 459.
 OUTSIDE INDUSTRIES (See "Unrelated Lines").
 OXGALL, by-product, 378.
 OXFORD SHEEP, 498, 500.

P

PACIFIC COAST, beef demands, 264; hogs, 443; marketing problem, 556; marketing of western cattle, 574; sheep, 597 (See also states by name).
 PACIFIC RAILROADS, and cattle, 191.
 PACKERS AND STOCKYARDS ACT, 1921, foreshadowed, 782; preliminary bills, protest of packers, 785-787; passage, summary, 787-790; packers' attitude, 790; policy of administration, 791.
 PACKERS' ENCYCLOPEDIA, 12.
 PACKING HOGS, as killing class, 494, 496*n*, 497.
 PACKINGTOWN, conditions in, 690-694.
 PAINTER HOGS, 52.
 PALMER, A. M., consent decree, 783-785.
 PALMER-PACKER AGREEMENT (See "Consent Decree").
 PANCREATIN, 369, 370, 370*n*, 378.
 PANHANDLE TRAIL, 177.
 PANIC OF 1873, and livestock, 180; recovery, 181.

- PARAF, —, oleomargarine, 359.
- PARIS, Ky., fair, 75-78.
- PARKE, H. H., county agent, 662.
- PARKINSON, —, Bedford hog, 48.
- PARTNERSHIPS, seasonal, of slaughterers and packers, 124; in early dressed beef traffic, 235, 388.
- PASTURES, special regions, 621 (See also "Grass Cattle").
- PATERSON, dressed beef, 235, 236.
- PATTERSON, ROBERT, cattle breeding, 60.
- PATTON STOCK, 42, 59.
- PECOS TRAIL, 178.
- PEDDLER CARS, 400-403, wholesale grocer opposition, 785n.
- PENN, WILLIAM, W. I. trade, 31.
- PENNSYLVANIA, early livestock and export, 30; legislature and dressed beef, 245; beef demands, 263; oleomargarine works, 359; sheep, 444 (See also "Philadelphia").
- PENNSYLVANIA CANAL, livestock, 81.
- PENNSYLVANIA RAILROAD, opening, 81; cattle transportation, 82; combine on rates, 202; experiment with cold transportation, 218; and dressed beef, 239; special lubricant, 362.
- PENSIONS, in packing plant, 707.
- PEORIA, packing, 101, 107, 108, 137; livestock exchange, 553n.
- PEPSIN, 361, 369, 370, 370n, 378.
- PERKINS, JACOB, ice machine, 213.
- PERRY, E. W., on packinghouses, 319.
- PHARMACEUTICALS, manufacture, 361, 369, 378; sources and uses, 370n.
- PHILADELPHIA, early meat industry, 31, 38; hogs as scavengers, 38; western cattle at, 73, 78; pork packing, 98; dressed beef, 235, 278, beef market (1921), 257; beef demands, 263; oleomargarine works, 359; cattle receipts (1900-21), 540.
- PHILLIPS, E. B., stockyards officer, 87n.
- PHOENIX, meat industry, 460.
- PHOENIX PACKING CO., 453.
- PHOSPHATE ROCK, fertilizer, 367.
- PICKETING, decision on, 742.
- PICKLE, tanks, 113.
- PICKLED MEATS, as real beginning of packing, 46.
- PICNICS, part of hogs, 351.
- PIG TICKET, 550.
- PINGER, DAVID, packing, 454.
- PIONEERS (See "Frontier").
- PITTSBURGH, pork packing, 98; tallow chandlers, 129; early dressed beef, 235; beef market (1921), 257; oleomargarine works, 359; cattle receipts (1900-21), 540; livestock exchange, 553n; hog outlets, 581; differential in hog prices, 658.
- PITTSBURGH & FORT WAYNE R. R., stockyards, 84.
- PITUITARY PRODUCTS, 370, 370n, 378.
- PLANKINTON, JOHN, beginnings, 149; and Armour, 151.
- PLANKINTON & ARMOUR, plants, 151, 152, 154; Cudahy and, 164; canning, 466n.
- PLANT DOCTOR, 374.
- PLATE, percentage of beef, 350.
- PLEASANTON, sheep center, 446.
- PLEURO-PNEUMONIA, and range cattle, 187; and European restrictions, 281, 282, 321.
- POLAND-CHINA HOG, breeding, value, 49; as lard type, characteristics, 490, 491.
- POLES, veal trade, 268; in packing industry, 688, 689.
- POLLED ANGUS cattle, importation, 437; as beef breed, characteristics, 483.
- POOLS, meat, 750-752.
- PORK, packing and products, eastern plants, seasonal packing, 108, 111, packing method, 114, 116, 282; measles, 116; classes of cured, markets, 117; new cuts, 117; early inspection, 118; price of lard and trimming, 129; and ham curing, 134; yields primacy to beef, 173; export and home beef competition (1921), 299, 301; export of dressed pork, 305; percentage of products (chart), 351; as joint products industry, cost accounting, departmentization, 421-428; importance, 441; chief consuming nation, 441; stability of consumption, 447; desired cuts, 496; seasonal consumption, 586; value of fresh (1914, 1919), 794 (See also "Bacon," "By-Products," "Cincinnati," "Export," "Hams," "Hogs," "Lard," "Meat Packing").
- PORKOPOLIS, name for Cincinnati, 4, 95.
- PORTERHOUSE STEAK, percentage of beef, 350.
- PORTLAND, ME., canning, 464.
- PORTLAND, O., beef market (1921), 257; laboratory, 370n; packing, 460; cattle loan cos., 506; cattle receipts (1910-21), 540; livestock exchange, 553n.
- POTASH, wartime supply, 477.
- POULTRY, distribution by packers, 406, 407, 784, 788.
- POWDER RIVER CATTLE CO., 186.
- POWELL, —, shorthorns, 60.
- POWELL, G. H., hog price control, 656n.
- PRAIRIE CATTLE CO., 185.
- PRESERVATIVES, and European restrictions, 284, 285, 287, 289; disclosures on use,

- 328; inspection, 340; embalmed beef episode, 470-472.
- PRICES, colonial livestock, 24, 26; livestock, at Span, New Orleans, 43; in Ohio Valley (1815-30), 43*n*; hog, before Civil War, influence of corn, 54; livestock and pack meat at Chicago (1832-33), 103; fluctuations as burden on packer, 142, 143; cattle (1874), 175*n*; rail rate war and cattle (1870), 180; range cattle (1878-81), 186; effect of railroads on, 190; influence of dressed beef on consumers, 249, 250; classification differential for cattle, 259-261; beef at New York and Philadelphia, 263; and sectional meat demands, 268; frozen beef in England, 275; export (1919-21), 301-303; beef cuts (1920), 350; Chicago, as basic, 382; elements in meat, 429-431; comparative, of cattle classes, 489; central markets and information, 538; livestock, set by buyers at central markets, 544, 552; determination of cattle, 563-565; surplus beef stores and cattle, 565, 566; effect of beef products export on cattle, 567; relation with cattle receipts, 567; fluctuations in short-time receipts, 568-571, packer's attitude toward livestock, 571, 572, 591, 592; determination of western cattle, 576-578; determination of hog, 585-591; and hog receipts, 592; causes of fluctuations in hog, remedy, 594, 596; factors in sheep, 603-605; seven year cycles in cattle, 618*n*; zoning system and stabilizing, 647; wartime control of hog, 650-659; corn and hog, 650; differentials in hog stabilizing, 658; and monopoly, 755; packers and conserving livestock, 777*n*; charge of control of meat, reply, 778-780 (See also "Distribution," "Marketing," "Profit").
- PRIME HEAVY HOGS, as packer class, 494.
- PRIME MESS PORK, 118.
- PRIME PORK, requirement, market, 116, 117.
- PRIVATE FREIGHT CARS, stock cars, 200; refrigerator, 397, 398; railroad contracts, 399; Govt. ownership recommended, 774.
- PROBLEMS OF MEAT INDUSTRY, 12-17.
- PROCESSING, in canning, 468, 469.
- PRODPOLE, 196.
- PRODUCTION, and consumption, areas (map), 7, 432, 534, 795-797; classes of cattle, 562; importance of branded cattle region, 573; concentration of hog, 579; classes of sheep, methods, 597 (See also "Consumption," "Distribution," "Livestock," "Meat Packing").
- PROFITS, by-products as forming, 127, 347, 350, 757; Garfield report on packer, 757-759; Fed. Trade Commission's report, reply, 780, 781 (See also "Monopoly," "Prices").
- PROMOTION, union system, 698; later system, 704.
- PROVIDENCE, packing, 98; dressed beef, 235, 236.
- PRUSSIAN BLUE, 133.
- PRUSSIAN POTASH, 133.
- PUBLIC ABATTOIRS, proposed, 661.
- PULP CATTLE, 259, 264.
- PURCHASING, quality control, 376 (See also "Marketing").
- PURE FOOD (See "Inspection").
- PUTNAM, G. E., on unit costs, 431.
- PYNCHON, WILLIAM, packer, 3, 23; cattelman, 22.
- QUALITY CONTROL, divisions, important, 375-377.

Q

QUINCY, ILL., packing, 101, 107-109.

R

RAILROADS, and centralized markets, 5, 91, 203; trunk lines and livestock, 5, 8, 80-82, 190; expansion and modern meat industry, 6, 8, 107; and refrigeration and dressed meat traffic, 8, 10, 224, 234, 237-245; and agricultural revolution, 47, 75; and stockyards at Chicago, 84-87; far western extension and cattle cowtowns, 174, 179, 191-195; cattle rates, 179, 200-203, 537, 554; cattle transportation regulations, 195-201, 536, 537; transportation of wartime meat products, 476 (See also "Marketing").

RAMBOUILLET SHEEP, 501.

RAMS, killing grades, 501*n*.

RANGES, period, 8; in colonial Virginia, 31; importance, 175; districts, 176, 183; basis of success, 176; origin, stocking from Texas, 176, 180, 188; trails to market, 177, 178; definite establishment, 179; panic of 1873, 180; factors in recovery, 181; eastern stock feeding, 181, 208-210; sources of information, 181*n*; periods in history, 182; rights, 182; plant, 182; breeds, 183, 437; life, 183, 184; great companies, rise and fall, 185, 186; boom years, 186; crisis and depression, 187; diseases, 187; Nat. Cattle Growers' Assn., proposed national

- trail, 188; financing, 188, 508; passing of open, 189; and railroad extension, cowtowns, 191-195; determination of price of cattle, 260, 576-578; recent adverse conditions, 437, 503; betterment movement, 438; cattle class, 484, 485; region as surplus area, 556; seasonal marketing, 559-562, 572-575; comparative importance as source, 562, 573; conditions influencing marketing, 563; territory, 572, 573; branding as indication of source, 573; sheep, 597.
- RANKIN, Texas cattle, 174*n*.
- RANKIN, T. L., refrigeration, 216, 219.
- RATIONS, canned, 475.
- RAW MATERIAL, quality control, 376.
- RAZOR-BACK HOGS, 24, 53.
- REBATES, complaint, 752.
- RECIPROCITY TREATIES, and meat export, 286.
- RED POLL CATTLE, breeding, 484.
- RED RIVER, cattle shipments, 177.
- REFERENCE SERVICE, in welfare work, 706.
- REFRIGERATION, and modern meat industry, 6, 379; Armour's work, 153; importance, 211; experiments and machines, 212-216, 220, 221, 357; early cold storage, 214, 215; packing plant refrigerators, 216; market for frozen beef, 266; ship, 277, 278; minimizing of waste, 354; American army plant in France, 478.
- REFRIGERATOR CARS, revolutionize meat industry, 8, 222, 224, 409; development, 217-222, 395; view of loaded, 223; private, problems, efficiency, 234, 397-399; railroad opposition, 237; form and requirements, 394, 395; loading, typical cargo, trip, 396; earnings, 399; railroad contracts, 399; peddler cars, 400-402; and handling of other commodities, 406, 784; Government ownership recommended, 774; bill on control, 786.
- REGULATIONS (See "Government regulations").
- RENICK, FELIX, cattle breeding, 60; eastern droving, 72, 72*n*, 73.
- RENICK, GEORGE, droving, 72, 73.
- RENICK, SEYMOUR, droving, 72*n*.
- RENNET, by-product, 370, 370*n*.
- RESEARCH, chemical, 373; duplication, 806; institute's plan, 808.
- RESERVOIRS IN MARKETING, sheep, 603, 636; hog, 631-633.
- RETAILERS, packers forbidden to be, 784; cooperation with packers, meat councils, 804-806; cost accounting, 806 (See also "Distribution").
- RETAINING ROOM, in inspection, 333.
- RETORT PROCESS, in canning, 469.
- RHODE ISLAND, cattle, 65; oleomargarine works, 359 (See also "New England").
- RIB ROAST, percentage of beef, 350.
- RICHARDSON, W. D., chemist, 361.
- RICHMOND, KY., beef cattle center, 432.
- RIVER PLATTE CONFERENCE, 296*n*.
- ROASTING PIGS, packer class, 494.
- ROBINS, A. & E., cold storage, 214.
- ROCHESTER, dressed beef, 235.
- RODDIS, EDWARD AND CUDAHY, 164.
- ROE, J. P., packer, 456.
- ROGERS, SHERMAN, on strike, 742.
- ROHE, A. T., institute program, 807.
- ROHE, CHARLES, officer, Packers' Assn., 803*n*.
- ROMNEY MARSH SHEEP, 498.
- ROOSEVELT, THEODORE, on ranges, 189.
- ROSE, chemist, 361.
- ROSS, A. B., county agent, 662.
- ROTTERDAM, meat import, 303.
- ROUGHs, packer hog class, 491.
- ROUMANIA, American meat, 281, 320.
- ROUND-UP, described, 183.
- ROUTT, J. L., Cattle Growers' Assn., 187.
- ROVER HOGS, 53.
- ROY, E. L., hog price control, 656-658.
- RUDNICK, PAUL, chemist, 361.
- RUMP SAWYER, duty, 332.
- RURAL CREDITS, federal bills, 531*n*, 532*n* (See also "Financing").
- RUSK, J. M., and inspection, 322, 326.
- RUSLING, J. F., on rates, 201*n*.
- RUSSELL, C. E., on Swift and dressed beef, 161; on beef trust, 760.
- RUSSIA, American meat, 283.
- RUSSIANS, packer labor, 689.
- RUSSO-JAPANESE WAR, canned meats, 473.
- RYAN, MICHAEL, Pres., Packers' Assn., 803*n*.

S

- SAFETY PLANS, in packing plant, 707.
- SAILING DAY (See "Zoning").
- ST. JOSEPH, packing plants, stockyards, 154, 163, 454, 455; beef market (1921), 257; laboratories, 370*n*; cattle loan cos., 506; cattle receipts (1880-1921), 540; livestock exchange, 553*n*; hog outlets, 581; differential in hog prices, 658.
- ST. LOUIS, early meat packing, 101, 105; bristles, 133; slow railroad development, 192; livestock market, stockyards, 204; beef market (1921), 256; beef demands, 264; oleomargarine works, 359; canning co., 466*n*; cattle receipts (1870-

- 1921), 540; livestock exchange, 553n; differential in hog prices, 658 (See also "East St. Louis").
- ST. LOUIS BEEF CANNING CO., patent suit, 465.
- ST. LOUIS DRESSED BEEF CO., absorbed, 761n.
- ST. LOUIS, KANSAS CITY & NORTHERN R. R., cattle line, 192.
- ST. PAUL, packing plants, 163, 460; Stockyards, 204; beef market (1921), 256; beef demands, 264; cattle loan companies, 506; cooperative shipments, 538; cattle receipts (1880-1921), 540; livestock exchange, 553n; fall surplus cattle, 575; feeder pig market, 580; hog outlets, 581; differential in hog prices, 658.
- ST. UBS SALT, 115.
- SALEM, market, 27; packing, 93.
- SALES MANAGERS, dept., 392.
- SALMON, E. E., on meat inspection.
- SALT, for packing, 115.
- SALT LAKE CITY, cattle loan cos., 506.
- SAMUELS, F., & Co., export, 278.
- SAN ANTONIO, beef market (1921), 257.
- SAN FRANCISCO, oleomargarine works, 359; packing, 460.
- SANBORN, H. W., refrigerator car, 220.
- SANDERS, A. H. Cattle Growers' Assn., 187.
- SANDERS, LEWIS, cattle breeding, 42, 60.
- SANITATION, in meat distribution, 394 (See also "Inspection").
- SANSINENA CO., 296n.
- SAPPLING-SPLITTER HOGS, 53.
- SARGENT, H. E., stockyard officers, 87n.
- SAUSAGE, beef for, 266; European restrictions, 285, 287; export (1921), amount, 305; making as joint products operation, cost accounting, 417; value (1914, 1919), 794 (See also "Casings").
- SAVINGS BANKS, cattle loan paper, 520.
- SCANDINAVIA, pork export and import, 308-311 (See also "Denmark," "Norway").
- SCHIFF, JACOB, and merger, 761.
- SCHMIDT, H. B., and chemical control, 361; beef extract, 362.
- SCHWARZCHILD AND SULZBERGER, refrigerator, car, 222; plant, 453.
- SCIOTO VALLEY, cattle trade, 74.
- SCOTCH, packer labor, 687.
- SCOTLAND, cattle range investments, 185.
- SEA LIONS, Texas steers, 179.
- SEATTLE, cattle receipt (1890-1921), 540.
- SECTIONAL MEAT DEMANDS, problem, 262-268.
- SELECTED BULLS, subclass, 486.
- SHACKLETON, ROBERT, on stockyards, 541.
- SHANGHAI, American meat agency, 283.
- SHAWNEE TRAIL, 177.
- SHAY, JOHN, packer, 94n.
- SHEELY, J. F., & Co., packers, 456.
- SHE-STOCK, market, 266.
- SHEEP, early raising, 22, 36; in Illinois, 44; decline, 252, 444, 446, 447; slaughtering under inspection, 336; distribution (1910), 443; sectional management of production, 443; trend of production (1840-1920, map), 444-447; present situation, prospects, 448-450; percentage to local and central markets, 535n; production and consumption areas, 534; methods of production wool and mutton types, 597, 601; spring lamb, 599; zoning system (chart), 642, 643 (See also "Breeding," "Classification," "Livestock," "Marketing," "Mutton").
- SHEEPSKINS, wartime supply, 477.
- SHEPARD, G. C., hog price control, 656n.
- SHERMAN, J. B., stockyard, 84; stockyards officer, 87n; and Morris, 157.
- SHERMAN, W. T., on newspapers, 471.
- SHORT-FED CATTLE, marketing, 561.
- SHORTHORN CATTLE, importation, breeding, 59, 60; range breed, 183; value, 437, as beef breed, 482.
- SHOULDERS, rank of foreign markets, 304; as desired cut, 496 (See also "Hams").
- SHROPSHIRE SHEEP, 498, 499.
- SIDER, duty, 332.
- SIMS BILL, 785.
- SINCLAIR, JOHN, packer, 458.
- SINCLAIR, T. M., packer, 458.
- SINCLAIR, T. M., & Co., plant, 458.
- SINCLAIR, UPTON, "The Jungle" and for eign restrictions, 287, 289; verity, 690.
- SINCLAIR, W. P., packer, 148.
- SINGAPORE, American meat agency, 283.
- SIOUX CITY, packing plants, stockyards, 154, 457, 458; beef market (1921), 257; cattle loan companies, 506; cattle receipts (1880-1921), 540; livestock exchange, 553n; hog outlets, 581; differential in hog prices, 658.
- SIOUX CITY DRESSED BEEF & CANNING Co., 458.
- SIOUX CITY PROVISION Co., 458.
- SIOUX FALLS, livestock exchange, 553n; differential in hog prices, 658.
- SIRLOIN STEAK, percentage of beef, 350.
- SKIN BAKES, 381.
- SLAUGHTERING, colonial, 25, 29; at Brighton, 27; early New York City regulations, 28-30, 37; home, 57; and packing, 119, 123, 124; before Civil War; houses, regulations, 119, 120; hog opera-

- tions, 120-122; cattle operations, improvement, 124-126; early and present capacity at Chicago, 125; experiments, 126; charge, by-products and payment, 128; and hides, 133; local conditions, 225-227, problem of urban, Massachusetts, reforms, 227-231; opposition of butchers to dressed beef, 242-245, 251; figures for chief markets (1921), 256, 257; classification of cattle for, seasonal receipts, 259, classification of carcasses, 261; abroad, 288, 289; method underfed, inspection, 331, 339; public abattoirs suggested, 661; division of labor, 683, 686 (See also "By-Products," "Live-stock").
- SLAVINS, OHEM & Co., canning, 466n.
- SLOVAKS, packer labor, 688, 689, 693.
- SMILEY, JEROME, on round-up, 184.
- SMILEY, cooling process, 278.
- SMITH, DEWITT, cattle growers' assn., 187.
- SMITH, H. R., Institute program, 807.
- SMITH, J. S., stockyards officer, 205n.
- SMITH, FARLOW & Co., plant, 454.
- SMITHFIELD MARKET, London, American dressed meat, 279, 283.
- SNOWDEN & McCONVILLE, export, 278.
- SNYDER, F. S., hog price control, 656n. 659.
- SOAP MANUFACTURE, early, 130; development as by-product, 131, 369; section in laboratory, 370n, 372.
- SOCIAL CONDITIONS (See "Labor").
- SOCIETY FOR PROMOTING AGRICULTURE, and cattle breeding, 59, 61.
- SOLOMON STURGES' SONS, treasurer stockyards, 87n.
- SOMES, D. E., refrigeration, 216n.
- SOUPS, wartime canning, 474.
- SOUTH, colonial cattle, 31-35; hogs before Civil War, 51; cotton and cattle, 67, 80, 440; meat markets, 80, 181; cured pork for slaves, 117; beef demands, 263; veal trade, 268; new cattle industry, 440.
- SOUTH AFRICA, meat export, 252.
- SOUTH AFRICAN WAR, canned meats, 472.
- SOUTH AMERICA, Am. and Brit. meat plants, 296, 296n, 297; dry hides, 353; Chicago packers and export, 774, 778.
- SOUTH CAROLINA, early upland cattle, hogs, export, 23, 26, 33-35; later hogs, 51, 442; later cattle, 67, 440.
- SOUTH DAKOTA (See "Dakota," "Ranges").
- SOUTH OMAHA, packing plants, 154, 163, 165, 456; laboratories and testrooms, 370n (See also "Omaha").
- SOUTH ST. JOSEPH (See "St. Joseph").
- SOUTHDOWN SHEEP, 498, 499.
- SOUTHERN PACIFIC R. R., construction, 191.
- SOUTHERN WHOLESALE GROCERS' ASSN., and consent decrees, 784, 785n.
- SPAIN, meat consumption, 254; Am. meat, 281, 287, 320; pork demands, 311.
- SPANISH-AMERICAN WAR, embalmed beef, 470-472.
- SPARERIBS, percentage of hog, 351.
- SPECIALTY MEN IN DISTRIBUTION, 392.
- SPECULATION, in early packing, 138, 139; as characteristic of meat packing, 144; dealing in futures, 379; packers and, 384, 385, 572, 591, 592; in feeder cattle business, 613.
- SPLIT SHIPMENTS, charge, answer, 774 777.
- SPLITTER, duty, 333.
- SPRINGER COWS AND HEIFERS, as subclass, 486.
- SPRINGFIELD, ILL., packing, 108.
- SPRINGFIELD, MASS., cattle and settlement, 22; early packing, 23, 26n; dressed beef, 236.
- SQUIRE, JOHN P., & Co., beginning, 99.
- STAFFORD, T. F., suit, 673.
- STAGS, cattle subclass, quality grades, 486-488; hogs, 494, 496n.
- STAMP OF INSPECTION, 335.
- STANDARD PACKING Co., plant, 460.
- STANDARDIZATION, quality control, 375-377; Chicago Board of Trade and, 383; difficulty in grading cattle, 557.
- STANLEY, A. P., cold storage, 215.
- STATISTICS (See "Information").
- STEAM, and by-products, 131.
- STEARIN, separation, 130; export (1921), 305; storage, 366n.
- STEARNS, O. P., decision on dressed beef, 247.
- STEER LOANS, length, 517.
- STEER RANGE DISTRICT, 183.
- STEERS (See "Beef Steers").
- STICKER, duty, 332.
- STILL-FED HOGS, 55.
- STOCK CATTLE, for eastern markets, 73.
- STOCK FEEDER, position, 63, 69, 75.
- STOCK GROWERS' FINANCE CORP., services, 529.
- STOCK PIGS, quality grades, 496n.
- STOCKER CATTLE, classification, 259, 485, 544; prices, 260; subclasses, 486; quality grades, 488, 489; loans on, 506, 508, 517, 523; stockyards and movement, 556; seasonal marketing, 559-562, 575; as price stabilizer, 565, 576; orderly

marketing, 622, 623 (See also "Feeder Stock").

STOCKER PIGS, marketing, 580.

STOCKER SHEEP, 598.

STOCKYARDS, rise, 5; problem of modern, 13; early Chicago, 82-86; trans-Mississippi, 204-206, 454, 455, 458; St. Louis, Cincinnati, 206; ownership of terminal facilities, 542; classes of cattle at, 543, 548; classes of buyers, 543; manner of judging cattle, 548-550; lack in California, 552; and movement from surplus areas, 556; advantages as markets, 557; government ownership, 661, 774; and interstate commerce, 673-675, 789*n*; sale of packer holdings, 783, 786; under Packers Act, 789 (See also "Chicago Union Stock Yards," "Marketing").

STOCKYARDS WAREHOUSE Co., absorbed, 761*n*.

STORAGE, of pork products, and hog prices, 586-589 (See also "Cold Storage").

STORES, cattle class, 71.

STRATFORD PORK, 117.

STRINGENCY, early packing during, 142.

STRIPPER CATTLE, 544.

STUART, GRANVILLE, cattle growers' assn., 187.

STUART, H. C., hog price control, 656*n*.

STUFFING MACHINE, 467.

SUBSTOCKS, organization, 392.

SUFFOLK SHEEP, 498, 500.

SULPHURIC ACID, wartime supply, 477.

SULZBERGER, FERDINAND, packer, 169.

SULZBERGER & Co., plant, 460.

SULZBERGER & SONS Co., Wilson as head, 169.

SUMMER LOANS, 506.

SUMNER, sheep center, 446.

SUPERIOR, cattle shipping, 538.

SUPPLY AND DEMAND, in meat industry, 429-431, 607-609; in cattle prices, 563, 567, 610, 769; in hog prices, 592-595; in sheep prices, 604; need of data, 618, 619, 627, 628 (See also "Marketing").

SUPRARENALS, 370, 370*n*, 378.

SUPREME COURT, on dressed beef traffic, 247; on stockyards and interstate commerce, 673-675; on picketing, 742; meat trust injunction, 753.

SURGICAL LIGATURES, 378.

SUTHERLAND, J. B., refrigerator car, 218.

SWAN LAND & CATTLE Co., 185, 186.

SWIFT, E. C., dressed beef, 233, 235.

SWIFT, G. F., cattle dealing, 9, 160; and dressed beef, 9, 10, 161, 232-236, 281, 386; early career, 159, 160; packing beginning, 161, 162; progress of plant,

branches, 162, 163, 455; character, 163; refrigerator car, 221; slaughter house reform, 231; arbitration on dressed beef rates, 241 (See also "Swift & Co.").

SWIFT, G. F. JR., hog price control, 656*n*.

SWIFT, L. F., birth, 160; on beginning of plant, 162; as head, 166; criminal prosecution, 763; Institute program, 807.

SWIFT, NATHANIEL, and brother, 160.

SWIFT, WILLIAM, dressed beef, 234.

SWIFT & Co., beginning, 161; development, branch plants, 162, 163, 453, 455, 457, 458, 461; marketing dressed beef in London, 279, 284; Orient agencies, 283; South American plants, 296*n*; percentage of by-products, 350; soap, 369; laboratory, 370-374; and Chicago Board of Trade, 385; local agencies, 386, 387; branch houses, 389-391, 406; substocks, 392; distribution expenses, 407; distribution of other commodities, 409; employees' stock investments, 706; benefit assn., 707; guaranteed time, 709; industrial relations dept., 713; wages (1914-21), 721; employee representation, 723, 730-734; and monopoly, 748, 773; pools, 751; profits deficit, 759, 781; Nat. Packing Co., 761, 765; reply to charges of Fed. Trade Commission, 776*n*, 778, 779 (See also "Swift, G. F.").

SWIFT REFRIGERATOR TRANSPORTATION Co., efficiency, 398*n*.

SWITZERLAND, American meat, 285.

SYKES, A., hog price control, 656*n*.

T

TAFT, W. H., on stockyards and commerce, 673-675; on picketing, 742.

TALIFERRO, T. W., hog price control, 656*n*.

TALLOW, candle factory, 129; export (1921), 305; percentage in steers, 349; refining, 363; uses, 377; value (1914, 1919), 794.

TAMWORTH HOGS, 490, 493.

TANKAGE, tank for condemned and non-edible products, 334, 341, 342; percentage in steers, 349; saving, use, 356, 361, 363, 366.

TARIFF (See "Export").

TAYLOR, droving, 174*n*.

TAYLOR, H. G., dressed beef, 232.

TENNESSEE, hogs, 51, 441, 442; peddler cars, 401; packing, 461.

TESTROOMS, canned meat, 470.

TETLOW, EDWARD & Co., dressed beef, 236.

TEXAS, as cattle source, 8, 65, 67, 68, 173-175, 434, 435, 437, 556; hogs, 51, 442; and northern ranges, 176, 180, 188; cattle trails, 177; character of cattle, prejudice, 178; proposed national trail, 188; cattle and extension of railroads, 193, 194; anti-trust convention, 248; sheep, 446, 447, 597; packing, 461; marketing, 560-562, 572; breeding-stock shortage, 619*n*.

TEXAS AND SOUTHWESTERN CATTLE RAISERS' ASSN., livestock board, 675.

TEXAS CATTLE, as class, dropped, 484.

TEXAS CATTLE RAISERS' ASSN., 514.

TEXAS FEVER, range cattle, quarantine, 187; proposed national trail, 188; European restrictions, 281, 282, 321.

TEXAS LAND & CATTLE CO., 185.

TEXAS STEERS, general name, 179.

THOMPSON, C. W., on Packingtown, 693.

THOMPSON, J. W., on Beef Belt, 4, 61; on colonial frontier, 35; on sectors of West, 41; on droving, 74; on ranges, 175, 189.

THYROID, 370, 370*n*, 378.

TIFFANY REFRIGERATOR CAR, 220.

TOFFEY, D. & BROS., export, 277.

TOKIO, Am. meat agency, 283.

TOLEDO, differential in hog prices, 658.

TOMLINSON, T. W., and marketing, 661.

TORONTO, test rooms, 370*n*.

TRACY, J. F., stockyards officer, 87*n*.

TRAILS, great western cattle, 177, 178; proposed national, 188.

TRANSPORTATION, Cincinnati and facilities, 4, 94; lack and livestock industry, 45; long hog, 51; river cattle, 177 (See also "Droving," "Railroads").

TRAVELING SALESMEN in meat distribution, 388.

TRAVELING VETERINARY INSPECTOR, 343.

TRICHINAE, European restrictions, 281, 282, 320, 321; investigation, 374.

TRIMBLE, ALLEN, cattle breeding, 60.

TRIMMER, duty, 333.

TRUNK LINE ASSN., livestock rates, 203.

TRUSTS (See "Monopoly").

TUNIS SHEEP, 498.

TUNSTALL, R. J., refrigerator car, 220.

TURKEY, American meat, 281, 320.

TURK'S ISLAND SALT, use, 115.

TURPIN, V. H., stockyards officer, 87*n*.

TURER, JAMES, canning, 466*n*.

TWINING, A. C., gas machine, 213.

TWO-DAY MARKET SYSTEM, 639.

U

UNION COLD STORAGE CO., 296*n*.

UNION COUNTY, OHIO, cattle region, 63.

UNION PACIFIC R. R., charter, 47.

UNIONS (See "Labor").

UNITED DRESSED BEEF CO., absorbed, 761*n*.

UNIVERSITY OF CHICAGO SETTLEMENT, and packing laborers, 699.

UNRELATED LINES, packer interest, 407-409; divorce, 661, 662, 783, 784.

URUGUAY, cattle, export, 252; American meat plants, 296 (See also "South America").

UTAH, sheep, 447; cattle marketing, 573, 574 (See also "Far West").

V

VACUUM MACHINES, canning, 467.

VALLANCE, ice machine, 212.

VAN RUYMBEKE, investigation, 361; tankage, 363.

VEAL, prices veal calves, 260; demand, 265, 267, 268, 447; classification, seasonal supply, 266, 267; and young beef, 267; bob, 267; packer subclasses, 486; quality grades of killing calves, 487*n*, 488; value (1914, 1919), 794.

VEEDER POOLS, 751.

VERMONT, sheep, 40, 444, 447; cattle, 65, 67; legislature and dressed beef, 245 (See also "New England").

VEST REPORT, on trust, 749.

VESTED BROS., 296*n*.

VETERINARY INSPECTION CLASS, duties, 342; traveling, 343.

VICTORIA OF ENGLAND, American beef, 276.

VICTORIA HOG, breeding, 49.

VIENNA, Mo., beef cattle center, 434.

VILES & ROBBINS, plant, 454.

VILLAFRANCA, BLASIUM, refrigeration, 212.

VIRGINIA, early packing, export, 23, 26, 33, 38; colonial cattle range, 31; bides, 32; hogs, 32, 51, 441, 442 (See also "South").

VOGEL, FRANK, MORRIS & Co., 168.

W

WADDELL, F. W., hog price control, 656*n*.

WADSWORTH, J. W., packing, 106.

WADSWORTH, DYER & Co., packing, 106; slaughtering, 125, 126.

WAGES (See "Labor").

WAGON HOGS, 58.

WAHL BROS. GLUE FACTORY, packers, acquire, 132, 357.

WALKER, FRANCIS, on trust, 759.

WALKER, J. M., officer stockyards, 87*n*, 205*n*.

- WALLACE, H. C., Lenroot bill, 531*n*; on Farm Bureau Fed., 664; on Packers Act, 788, 791.
- "WALLACE'S FARMER," on cycles in cattle prices, 618*n*, 619*n*; hog price control, 651.
- WAR FINANCE CORPORATION, livestock financing, 530, 531.
- WAREHOUSES, first dressed beef, 232; registration, 383; govt. ownership, 774 (See also "Cold Storage").
- WARMED-UP STEERS, 561.
- WASHING MACHINES, in slaughtering, 335, 337; in canning, 469.
- WASHINGTON, GEORGE, merino sheep, 40.
- WASHINGTON, cattle, 67; dressed beef, 235, 236; beef demands, 263 (See also "Pacific Coast").
- WASTE (See "By-products").
- WATER PROCESS, in canning, 469.
- WATERBURY, E. S., hog price control, 656*n*.
- WATTLES, hog, 53*n*.
- WAVERLY, beef cattle center, 434.
- WEIGHT, factor in hogs, 55-57, 490, 496-498.
- WELD, L. D. H., on refrigerator cars, 217; on dressed beef, 234; on efficiency of marketing, 405; on percentage of purchases, 766*n*.
- WELFARE WORK, in packing industry, 706.
- WEST HAMMOND, fertilizer factory, 370*n*.
- WEST INDIES, meat export to, 3, 23, 28, 36, 39, 117.
- WESTERN CATTLE, as classification, 484, 485; distinguished from range, 572, 573; branding as indication, 573; fall shipments, 573-575; minor movements, 574; determination of price, 576-578; problems of marketing, time, place, 577; orderly marketing, 623-625; direct trading with feeder region, 625.
- WESTERN LAND & CATTLE Co., 186.
- WESTERN PACKING & PROVISION Co., allied packers' plant, 801.
- WESTERN RANCHES, 186.
- WESTERN SHEEP, as class, 597, lamb classes, 599; cycle of marketing, 599-603, 605; orderly marketing, 635, 636.
- WESTFIELD, sheep center, 446.
- WETHERS, grades, 501*n*, 502.
- WHISKEY REBELLION, and livestock industry, 3, 43.
- WHITE, F. E., head of Armour, 154.
- WHITE PROVISION Co., plant, 461.
- WHOLESALE, meat distribution, 386, 406.
- WICHITA, beef market (1921), 257, packing plants, 454; livestock exchange, 553*n*; differential in hog prices, 658.
- WILMINGTON, fertilizer factory, 370*n*.
- WILSON, JAMES, foreign restrictions, 287.
- WILSON, ROBERT, pharmaceuticals, 370.
- WILSON, T. E., career, 166-169; on chemical control, 347; on quality control, 375-377; on reform in marketing, 606; hog price control, 655, 656; on co-operation, 660, 809; govt. supervision, 790; Pres. Institute, 803; educational plan, 807.
- WILSON, W. B., packing plant labor, 718, 720, 722.
- WILSON, W. J., canning, 464.
- WILSON, WOODROW, meat investigation, 770, 771.
- WILSON & Co., organization, 169; S. Am. plants, 296*n*; quality control, 375-377; refrigerator cars, 395; Los Angeles plant, 460; industrial relations dept., 713; employee representation, 723, 734; monopoly, 773; deficit (1921) 781.
- WILSON PACKING Co., canning, 464, 465.
- WILTSHIRE CUT, 307, 308, 496.
- WINANS, CHARLES, on dressed beef, 232.
- WIND-SPLITTER HOGS, 53.
- WINDHAUSEN, FRANZ, ice machine, 215.
- WINDSHIP, JONATHAN, Brighton Market, 69.
- WINSLOW, EDWARD, imports cattle, 21.
- WINSLOW, HEZEKIAH, canning, 464.
- WINSTON, F. H., stockyards officer, 87*n*.
- WINTHROP, JOHN, on West Indies trade, 23.
- WIRING ON, charge, answer, 774, 777.
- WISCONSIN, hogs, 51, 442; anti-trust convention, 248; peddler cars, 401; sheep, 447.
- WOBURN HOG, 48.
- WOMEN, in packing industry, 689; union, 696; rest rooms, 706.
- WOOD, G. K., refrigerator car, 218.
- WOOL, by-product, 378; in sheep classification, 498-501; as object of production, 597, 598, 601; and sheep prices, 603.
- WOOLLEY, E. M., on meat industry during World War, 474.
- WORCESTER, colonial market, 25; meat warehouse, 232; dressed beef, 235.
- WORLD WAR, meat exports, demand and supply, 292-294, 473-477; post-war meat demand, 294; post-war exports, 300-303; other services of packers, 477; packers' admin. problems, 477; Am. Army refrigeration plant, 478; post-war livestock depression, financing, 528-531; zoning system in cattle market, 638-650;

hog price control, 650-659; effect on packer labor, 712-721.

WYOMING, anti-trust convention, 248; cattle, 437; sheep, 443, 446, 447; cattle marketing, 573, 574; breeding-stock shortage, 619*n* (See also "Far West," "Ranges").

X

XENIA, banks and cattle feeders, 140.

Y

YANCY, C. E., hog price control, 656*n*.

YEARLING HEIFERS, as subclass, 486; quality grades, 488.

YEARLING STEERS, as subclass, 486, quality grades, 488.

YEATON, pork export, 98.

YORKSHIRE HOGS, 490.

Z

ZONING SYSTEM, purpose, 14, 638-640; conditions before, 569, 570, 608; results (charts), 640-643; success, war-time difficulties, 643-646; Chicago zones, 646; criticism, 647-649; general application, 649; recommended, 661.

PHILLIPS ACADEMY



3 1867 00003 1646

Inspection Act - 1966

Food & Drug Act

24464-21-30 228-231
+ 198, 201

24464

338.1

Clemen

C59

American livestock
and meat industry

